ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Assessment of Pharmacy Workforce in Ethiopia

BY

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Advisor: Dr. Teferi Gedif

March, 2011

Addis Ababa

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Pharmacoepidemiology and Social Pharmacy

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Declaration

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university.

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April, 2011

Acknowledgments

My sincere and deepest gratitude goes to my advisor Dr. Teferi Gedif for choosing me this topic and for his unreserved assistance in giving me timely comments and relevant guidance from the conception of the research to the write-up of the final thesis.

I am very grateful and would like to extend my heartfelt thanks and appreciation to all the study participants, the data collectors and the pharmacy staff in the studied institutions for their cooperation during the data collection.

I am also very grateful to the Ethiopian Pharmaceutical Association staff especially to Ato Hailu Tadeg, Asmamaw Sileshi, and Melese Alemu for their unreserved support during the data collection. I also thank to W/ro Fikerte Asfaw, Ato Minalbat Getachew, Zewdu W/kirkos and Birhanu Habte for their support. I am grateful to Tesfaw Sileshi who helped me in census data collection and organizing key informant interview for Amhara Regional State.

I would like to thank my friends Eskinder Eshetu and Belete Ayalneh for their support in the translation of the questionnaire for in-depth interview, material and moral supports. I am also thankful to all my friends especially to Teklehaimanot Mezgebe, Gebremedhin G/slassie, Dawit Teshome, Micheal Aweke, Kebede Abera, Bruck Messele, Tesfaye Tsigu and Zenebech Adelo for their material and moral support during the course of the research.

Finally, I would like to acknowledge the Graduate Program of Addis Ababa University and Ethiopian Pharmaceutical Association for funding this project.

Table of Contents

Pages

Acknowledgments I

Table of Contents II

List of Tables IV

List of Figures V

List of Annexes VI

List of Abbreviations VII

Abstract VIII

1. Introduction 1

2. Literature Review 4

2.1. Human Resources for Health 4

2.2. Human Resources for Pharmaceutical Sector 9

2.3. Human Resources for Health in Ethiopia 13

3. Objectives of the Study 16

3.1. General Objective 16

3.2. Specific Objectives 16

4. Materials and Methods 17

4.1. Description of the Study Site 17

4.2. Study Design 17

4.3. Source and Study Population 17

4.4. Sampling and Sample Size Determination 18

4.5. Data Collection and Management 20

4.5.1. Data Collection 20

4.5.2. Data Collection Instruments 20

4.6. Study Variables 22
4.7. Data Entry, Clean up and Analysis 23
4.8. Ethical Considerations 24
4.9. Operational Definitions 25
5. Results 26
5.1. Findings from Census and Document Review 26
5.1.1. Socio-demographic Characteristics and Pattern of Practice 26
5.1.2. Density of Pharmacists per 100,000 Population 28
5.1.3. Forecasting the Required Number of Pharmacists for Ethiopia 29
5.1.4. National Loss Rate of Pharmacists in Ethiopia 33
5.2. Findings from the Cross-sectional Study 34
5.2.1. Socio-demographic Characteristics of Respondents 34
5.2.2. Opportunities for Continuing Pharmacy Education 36
5.2.3. Pharmacists‘ Job Satisfaction and Plans of Changing Work-life 36
5.3. Findings of Key Informants‘ Interviews 47
6. Discussion 54
7. Conclusion and Recommendations 63
References 64

List of Tables

Pages

Table 5.1: Distribution of Pharmacists by Region/City Administration and Gender, Ethiopia, 2010 ……....27

Table 5.2: Proportion of Actively Working Pharmacists by Area of Practice and Gender, Ethiopia, 2010 ……....27

Table 5.3. Density of Pharmacists per 100,000 Population by Region/City Administration, Ethiopia, 2010…….29

Table 5.4. Fifteen Years Forecasted Demand of Pharmacists for Ethiopia Based on Forecasted GDP per Capita and Projected Population Size, Ethiopia, 2010....……32

Table 5.5.Socio-demographic Characteristics of Respondents (N = 393*), Ethiopia, 2010……..35

Table 5.6. Job Satisfaction Mean Values for All Pharmacists and by Sex, Ethiopia, 2010…….37

Table 5.7.Pharmacists‘ Job Satisfaction Mean Values by Age Group and Years of Professional Work Experience, Ethiopia, 2010……...39

Table 5.8. Work Satisfaction Item Means by Level of Cities/Towns, Ethiopia, 2010 ……40

Table 5.9: Work Satisfaction Item Means by Area of Practice, Ethiopia, 2010 ……...42

Table 5.10. Pharmacists‘ Likelihood of work-life Change within the Next Two Years (row %) N = 393*, Ethiopia, 2010……. ……43

Table 5.11: Pharmacists‘ Likelihood of work-life Change within the Next Two Years by Age Group, Years of Work Experience and Area of Practice, Ethiopia, 2010 …..44

Table 5.12. Recommendations Forwarded to retain Pharmacists within their Profession and in their Current Area of Practice ……...46

List of Figures

Pages

Figure 5.1. Proportion of Actively Working Pharmacists by Region and Area of Practice, Ethiopia, 2010……...28

Figure 5.2. Pharmacists‘ Density versus GDP per Capita (USD) of the Lower and Middle Income Countries…….....30

Figure 5.3. Pharmacists‘ Density versus GDP per Capita (USD) of the Lower, Middle and Higher Income Countries……..31

Figure 5. 4. Pharmacists‘ Annual Loss Rate in Ethiopia (1993 - 2006)…….....33

Figure 5.5. Pharmacists‘ Main Reasons to Change Work-life, Ethiopia, 2010.....45

List of Annexes

Pages

Annex-I: Sampling Frame for the Cross- sectional Study, Ethiopia, 2010……...75

Annex-II: Formats used for Census (Complete Enumeration) of Pharmacists in Ethiopia……...76

Annex-III: Self Administered Questionnaire for the Data Collection on Pharmacists' Level of Job Satisfaction and Work-life Change ……...77

Annex-IV: Guide for Key Informant Interview with Persons from Federal Ministry of Health ……82

Annex-V: Guide for key informant interview with Persons from Regional Health Bureaus ……..85

Annex-VI: List of Countries Density per 100,000 Population and GDP per Capita (USD) By World Bank Income Classification ……...88

Annex-VII: Amharic Version of Guide for Key Informant Interview with Persons from Federal Ministry of Health ……90

Annex-VIII: Amharic Version of Guide for Key Informant Interview with Persons from Regional Health Bureaus ……93

List of Abbreviations

AGRG	Annual Growth Rate of GDP per Capita
ALR	Annual Loss Rate
BPR	Business Process Re-Engineering
CSA	Central Statistics Agency
CE	Continuing Education
CPE	Continuing Pharmacy Education
EMRO	East Mediterranean Regional Observatory
FIP	International Pharmaceutical Federation
FMOH	Federal Ministry of Health
FMOFED	Federal Ministry of Finance and Economic Development
GDP	Gross Domestic Product
GHWA	Global Health Workforce Alliance
HRH	Human resources for health
LCFRD	Library of Congress-Federal Research Division
MDGs	Millennium Development Goals
NGOs	Non Governmental Organizations
RHBs	Regional Health Bureaus
RPSGB	Royal Pharmaceutical Society of Great Britain
SNNPR	Southern Nations, Nationalities and People‘s Region
UK	United Kingdom
USA	United States of America
USD	United States Dollar
WHO	World Health Organization

Abstract

Background: Human resources for health have long been recognized as the cornerstone for the success of the health sector programs. In this regard, proper planning of the development of human capital based on evidence related to the number of working force available, factors that contribute to the attrition of the available health professionals and international standards, is crucial. Although most developed countries have a well documented data of health workers in general and pharmacy workforce in particular, the developing world like Ethiopia are severely lagging in developing an evidence related to its education and work-force development. The country lacks an adequate national pharmacy workforce data. As a result, fundamental questions regarding the status of the pharmacy workforce, its level of performance and the problems they face remain largely unanswered. So, the results of this unique national survey allow critical evaluation of the national pharmacy workforce which should be considered in the national health care policies and workforce planning that impact the health, labor and education policies.

Objective: To assess pharmacy work force in Ethiopia.

Methodology: A national census and descriptive cross-sectional survey of the pharmacy workforce in Ethiopia was conducted between June and September, 2010. A complete enumeration of pharmacists was conducted in all pharmaceutical sectors across the country. On the other hand, other variables related to pharmacists‘ job satisfaction and work-life change were assessed taking cross-section of the pharmacists by applying stratified sampling method. Six regions/city administration (Afar and Benshangul Gumuz from the historically disadvantaged regions and Addis Ababa, Amhara, Oromia, and Tigray from the other regions/city administration) were involved in the study. Both qualitative and quantitative methods were employed in data collection. The quantitative data was collected by self administered questionnaire, census form and structured data abstraction format. The qualitative data was collected by in-depth interview with key informants from the Regional Health Bureaus, Federal Ministry of Health and pharmacists from different batches.

Results: The total number of pharmacists in the country was 1898 (2.38 pharmacists per 100,000 population). Pharmacists were found unevenly distributed between regions, private and public sectors. The maldistribution of pharmacists was evident that pharmacists‘ density per 100,000

population ranges from 0.66 in Afar to 29.88 in Addis Ababa. To attain WHO recommended ratio and African countries average pharmacists density, currently Ethiopia needs to have a total of 39,918 and 6,387 pharmacists, respectively. The forecasted demand of pharmacists for 2024/25 fiscal year based on both the lower and middle income countries scenario, and the lower, middle and higher income countries scenario is estimated to be within the range of 28,278 to 30,003 pharmacists. The fourteen years (1993-2006) annual average Pharmacists' loss rate was found to be 6.5%.

Pharmacists appeared to be less satisfied with their work, with overall mean job satisfaction score of 3.0 (SD = 1.11) in a scale of 1-5. Relation with colleague and fellow professionals was an item with the highest mean job satisfaction score (3.74 ± 1.06), while remuneration (with mean score of 2.55, SD = 1.22) ranked least by pharmacists. Pharmacists working in hospital pharmacy, level IV cities/towns, and younger pharmacists were significantly less satisfied than pharmacists on the other category. Out of 393 pharmacists interviewed, 37.7%, 11.2% and 12.1% of them reported that they were highly likely to leave their current area of practice, reduce hours of work, and leave the profession within the next two years, respectively.

Conclusion and Recommendation: This study has shown that the country suffers from shortage of pharmacists, particularly the emerging regions. The double digit economic development of the country contributes to increase the demand for pharmacists and the forecasted need for 2024/25 fiscal year is about 28,278 to 30,003 pharmacists. The introduction of new curriculum is also expected to boost the country's demand for more number of pharmacists. This shortage of pharmacists could undermine equitable access and availability of medicines to the communities in the country and therefore deter the reduction of morbidity and mortality. Hence, the government should give due attention to maximize patients' benefit from the underutilized pharmacy profession.

Key words: Pharmacy, Ethiopia, Pharmacist density, Job satisfaction, Plan to change work-life.

1. Introduction

Health workers have been defined by WHO as people whose job is to protect and improve the health of their communities. These health workers, in all their diversity, make up the global health workforce (WHO, 2006). Human resources are an essential input into the delivery of health services and a critical component in health policies (Narasimhan et al., 2004; Magnus and Pieter, 2006; WHO, 2006). There is a consensus that despite their importance human resources have been a neglected component of health system development in low income countries (Charles and Barbara, 2004).

Currently human resources are in very short supply in the health systems of low and middle income countries compared to high income countries or with the skill requirements of a minimum package of health interventions. Hence, in the present decade the health sectors of low income countries needs much more health workers to deliver the basic health services and possibly achieve the health sector related Millennium development goals (MDGs). At least three and arguably all of the MDGs will not be achieved without improvement in the functioning of health systems (WHO, 2009).

Although substantial new resources are promised to health systems, many of the constraints cannot easily be resolved by money alone (Charles and Barbara, 2004). Hence, to take advantage of these opportunities, a strong and vibrant health system is essential. Yet such systems are impossible without health workers who are the ultimate resource of health systems. Yes, money and drugs are needed, but these inputs demand an effective workforce. For it is people, not just vaccines and drugs, who prevent and cure disease. Workers are active, not passive, agents of health change (Adams *et al*., 2004). Hence, with the financial problem is there equally serious concerns exist about the quality and productivity of the health workforce in low income countries. Among available strategies to address the problems, expansion of the numbers of health workers through training is highly constrained in low income countries (GHWA, 2008).

Higher worker density is an important determinant of improving population health and human survival. The density of workers in a population can make an enormous difference in the effectiveness of MDG interventions to reach the targets (WHO, 2009). However, the low income countries are severely suffering from shortage of health workers. Analysis of global health workers done by Adams *et al*. (2004) showed that, Sub-Saharan Africa has a tenth of the nurses and doctors for its population that Europe has. In addition, nearly all countries have maldistribution of health workers, which is worsened by unplanned migration. Highly skilled workers are shifting from poorer to richer regions and from the public to the private sector. One of the main reasons for the mobility of health professional is the availability of high global market for health workers at many levels that they can get more payments (Adams *et al*., 2004). Other reasons for migration include poor working conditions, lack of career opportunities, dissatisfaction with management and need for career development (Stilwell *et al*, 2004).

Pharmacists represent the third largest healthcare professional group in the world. The majority of pharmacists practice in community pharmacies, hospital and other medical facilities. Smaller numbers of pharmacists are employed in the pharmaceutical industry, academic and research institutions, regulatory and other sectors. Though shortage of pharmacists is an issue in both developing and developed countries, it is very serious in developing countries. The data collected by FIP revealed that the pharmacist to population ratios varies widely from less than 5 pharmacists per 100,000 populations to as high as over 200 pharmacists per 100,000 populations in some countries. The low availability of pharmacists in many developing countries is exacerbated by geographical distribution disparity between rural and urban areas (Chan and Wuliji, 2006).

Ethiopia is one of the countries with the poorest health status and the density of health workers is very low compared to other countries. A study by Adams et al (2004) showed that Ethiopia had a fiftieth of the professionals for its population that Italy does. Though there is an improvement, the training of health professionals in Ethiopia is still very low. According to GHWA report of 2008, Ethiopia trains about 200 doctors a year for a population of 74 million and the United Kingdom trains more than 6,000 doctors for population of about 60 million (GHWA, 2008).

In many countries, pharmacists are the most accessible of all healthcare workers and as such play a key role in the delivery of healthcare services at all levels. But the role of pharmacist in Ethiopia is not well recognized and still remains one of the underutilized professions. The country also lacks a comprehensive document of pharmacy workforce. Therefore, this study is intended to elicit basic information of pharmacy workforce that will help in critical evaluation of the national pharmacy workforce.

2. Literature Review

2.1. Human Resources for Health

Health systems of some sort have existed as long as people have tried to protect their health and treat disease, but organized health systems are barely few decades old, even in industrialized countries. Many have gone through several, sometimes parallel and sometimes competing, generations of development and reform, shaped by national and international values and goals (WHO, 2007). Human resources are the crucial core of a health system, but for many years they have been a neglected component of the health-system development (Hongoro and McPake, 2004).

After a long period of neglect, the issue of human resources has gained much greater prominence on the international health agenda as both a barrier to and opportunity for effective reform of health care delivery (Dubois and McKee, 2006). WHO defines the health workforce as all people engaged in actions whose primary intent is to enhance health (WHO, 2006). This statement reinforces the WHO concept of health systems as comprising all organizations, people and actions whose primary intent is to promote, restore or maintain health (WHO, 2007; WHO, 2009). These days, human resources are described as the heart of the health system in any country, the most important aspect of health care systems, and a critical component in health policies (Hongoro and McPake, 2004).

Human resources are a strategic capital in any organization, particularly health service organizations are highly dependent on their workforce (Neeru and Mario, 2009). The functioning and growth of health systems depends on the availability of human resources and on the time, effort and skill mix provided by the workforce in the execution of its tasks. Health care is extremely labor intensive, perhaps more than any other public sector activity (Dubois et al., 2006; Gilles and Carl-Ardy, 2003; Ozcan *et al*., 1995) and there is growing international recognition that one of the key ingredients in achieving improved population health outcomes is stronger health system including an adequate and available health workforce (Anand and Barnighausen, 2004; Neeru and Mario, 2009; Dräger *et al*., 2006). At the same time, there is general consensus that despite their importance human resources for health (HRH) has been a

neglected component of health systems development in low-income and middle-income countries (Gilles and Carl-Ardy, 2003; Hongoro and McPake, 2004).

In many countries, lack of personnel is one of the most important constraints to strengthening the delivery of primary and other health services, including curative, promotional, preventive and rehabilitative services (WHO, 2009). Over a billion people worldwide have little or no access to health services and the help and advice of health workers. As a result, millions die or are disabled every year. In 2006, WHO alerted the world to a shortfall of 4.3 million trained health workers globally. The double burden of infectious and non-communicable diseases in developing countries and the ageing population in developed countries is placing increasing demands on health systems worldwide. Projections also show that an extra 8.5 million healthcare workers will be needed globally by 2025 (GHWA, 2008).

Shortage in health workers is a global problem that affects all countries in different ways, but the greatest shortages are in the poorest countries. Fifty-seven countries are in crisis, including 36 in sub-Saharan Africa, six in South East Asia, and five in Latin America and the Caribbean (GHWA, 2008). Though there is no recent data of HRH, according to WHO report of 2006, Africa constitutes about 10% of the world‘s population and bears 24% of the global disease burden but has only 3% of the world‘s health workforce and less than 1% of the world‘s financial resources for health (WHO, 2006). In sub-Saharan Africa, the health workforce crisis is so great that almost all countries are considered to have a critical shortage of health care professionals to provide minimum coverage of even the most basic services in maternal, newborn and child health. Sub-Saharan Africa alone needs 1.5 million more health workers to provide basic health services for its population i.e. the current workforce needs to be scaled up by almost 140% (WHO, 2009). In many of the poorest countries of the world, the situation is worsened by the continual loss of health personnel seeking better opportunities elsewhere. Unless drastic measures are taken, the situation is likely to get even worse (WHO, 2006).

Many strategies are in place to overcome problems related to HRH and among those, availability of adequate number of the health workforce is in the forefront. There are ample evidences that worker numbers and quality are positively associated. For instance, the quality of doctors and the density of their distribution have been shown to correlate with positive outcomes in treating

disease (WHO, 2006). On the other hand, in many low-income countries like Africa which have the lowest health worker density, health worker shortages hamper progress towards meeting the health-related MDGs (Kruk *et al*., 2010). Hence, without enough health workers, the health-related MDGs and other health goals will not be achieved (GHWA, 2008).

Many countries lack the human resources needed to deliver essential health interventions for a number of reasons, including limited production capacity, migration of health workers within and across countries, poor mix of skills and demographic imbalances. The formulation of national policies and plans in pursuit of health workforce development objectives requires sound information and evidence. Against the backdrop of increasing demand for information, building knowledge and understanding of the health workforce requires coordination across sectors. It is being increasingly recognized that cross-national comparisons provide opportunities for gaining insights into many HRH issues of major concern to many countries and learning how other countries have dealt successfully or otherwise with these issues (Dubois and McKee, 2006; Neeru and Mario, 2009).

Unfortunately, the health care workforce traditionally has ranked low on the health policy agenda of both national governments and international agencies (Narasimhan *et al*., 2004). The workforce in many low-income countries is adversely affected by severe underinvestment from the national funds, as well as from external sources. The human resources involved in the provision of health care have often been seen as a recurring burden rather than capital assets that represent an investment for the future. As a result, most countries face chronic problems caused by supply–demand imbalances, maldistribution of health workers, skill imbalances and poor working environments; reflecting poor human resource management and regulation (Dubois *et al*., 2006).

The effects of poor workforce planning and development are felt everywhere. In Africa, Asia and the Pacific, many countries have a shortage of health workers capable of treating chronic and emerging diseases. In Europe, the countries of the independent states of the former Soviet Union inherited a workforce that was especially ill-suited to the demands facing modern health care systems (WHO, 2009). It is therefore important for human resources planning system to be set

into place in any country, with human resources planning integrated into the long-range policy-making and health-planning processes of the country (Ozcan *et al*., 1995).

Forecasting of human-power requirement over a number of years is the cornerstone of any country human resource management. Government planners have used various approaches to forecast HRH (O'Brien-Pallas *et. al*., 2001). Essentially there are two components that need to be considered in the process of human-power planning-supply of and demand for human-power. The future supply of human-power is based on the availability of current staff, the rates of leaving and future additions to the staff. The existing staff will also shift from one category to another due to movements within (i.e. promotions) and between organizations (i.e. transfers). It will be depleted by the departures from the organization, deaths, migration and retirements. Addition to the staff will result from staff moving from other organizations or sectors, immigration and the training and recruitment of newly qualified staff (Hornby *et al*., 1980).

Many methods have been designed for estimating the requirements of various health human-power categories. They are classified into four broad categories as discussed below (Dreesch *et al*., 2005; Hall and Mejia, 1978; Khan and Sithole, 1991; Kolehmainen-Aitken, 1993).

A. **The personnel (human-power)-to-population ratio method:** A theoretical relationship (ratio) is established between the population and the requirement for health service professionals. In this method once the desired human-power/population ratio is fixed for each human-power category, the only data required is population projections**.** Personnel-to-population ratios method is popular in the estimation of medical human-power needs and has been used frequently to assess unmet needs for allied health professional services.

B. **The service-targets method:** In this approach the primary focus is on setting targets for the production and delivery of various kinds of specified health services based on diverse criteria of needs and feasibility. These services are then converted into the human-power needed to meet them by means of staffing and productivity standards**.**

C. **The health-needs method:** This method seeks to determine what health services people actually require to keep them healthy. The determinations are made by health professionals, with or without the involvement of the consuming public, and are based primarily on medical and technological considerations. Other issues, such as cost, the capacity to deliver the service needed, and the degree to which people are apt to seek the services, may be important but are of secondary concern. This method projects age- and gender-specific _service needs' based on service norms and morbidity trends, and converts projected service needs to persons requirements using productivity norms and professional judgment. Health needs as determined by experts should be distinguished from health wants, which reflect the services desired by the public whether or not health professionals consider them to be necessary.

D. **The health (economic) demand method:** This method asks what numbers and kinds of health services people will actually use at the anticipated monetary and other cost of obtaining these services. Current health service utilization rates are good measure of the met demand (also termed the satisfied demand) for health services and the planner may also want to take into account the unmet demand for services, given certain assumptions about their cost and accessibility. For this method the professionally determined need for and the quality of services to be demanded are of secondary importance.

As health care cannot function without medicines, the availability of both medicines and a pharmacy workforce in adequate numbers and skills is crucial for ensuring a well functioning health care system (Doucette *et al*., 2010). However, shortage is one of the obstacles in delivering quality pharmaceutical services. The great shortage of pharmacists in developing countries, especially in government services, is part of general health manpower problem - of numerical and qualitative imbalance between need or demand and supply. Hence, the adoption of rational policy on essential drugs necessarily requires the development of rational pharmacy manpower policy in the context of general policy on health services and manpower development (WHO, 1988).

2.2. Human Resources for Pharmaceutical Sector

In terms of modern health care delivery, studies have shown that engaging multidisciplinary expertise is one of the goals for achieving ultimate population health and it is believed that pharmacists could make a greater contribution to the provision of quality health care (WHO, 1996). This is particularly the case in developing countries, where health needs are greater and public sector health care provision is limited (Smith, 2004). However, despite the pharmacy profession is recognized for its importance as a health care provider in many developed countries, it is still underutilized in most developing countries (Anderson, 2002; Azhar *et al*., 2009).

Although all health care providers and the public are involved in using drugs, WHO has recommended a special role for pharmacists, particularly in quality assurance and the safe and effective administration of drugs (Mil, 1999). The International Pharmaceutical Federation (FIP) and WHO developed the concept of "The seven star pharmacist", which stated that a well-rounded pharmacist should be a compassionate care giver, decision maker, active communicator, lifelong learner and good manager; and should possess good leadership qualities and the ability to be a teacher and researcher (Azhar *et al*., 2009; Wiedenmayer *et al*., 2006).

Pharmacist represents the third largest healthcare professional group in the world. The majority of the pharmacists practice in the community pharmacies, hospitals and other medical facilities. Smaller numbers of pharmacists are employed in the pharmaceutical industry, regulatory, academic and research institutions (Chan and Wuliji, 2006).). In all these fields, their aim is to ensure optimum drug therapy, both by contributing to the preparation, supply and control of medicines and associated products, and by providing information and advice to those who prescribe or use pharmaceutical products (WHO, 1988). They are the drug therapy experts on the health care team and have a more important role in meeting the needs of their patients as the medication management experts (Gonzalez-Martin *et al*., 2002).

Pharmacists are also the most accessible health care providers because they offer longer hours and can often be accessed without an appointment. Because of their knowledge, skills and accessibility, pharmacists are positioned to ensure that patients, other health care providers and the health care system safely achieve optimal drug therapy outcomes. In the primary care setting,

pharmacists provide direct patient care; face-to-face counseling and education for their patients; prescribing advice for other providers; advice on cost-effective drug therapy and options for treatments; and chronic disease therapy management. Hence, they are essential to optimal primary health care (Canadian Pharmacists Association, 2004).

However, the role most people associate with a pharmacist is dispensing medications (Canadian Pharmacists Association, 2004). As a result, pharmacists found themselves over-trained for what they did and underutilized in relation to what they know. The profession's response to the resultant stress and role ambiguity has been a movement toward re-professionalization. The process of re-professionalization took on different forms, manifesting itself primarily in a gradual shift away from the technical paradigm, with the emphasis on drug products and their preparations, toward a more disease and patient orientated approach to pharmaceutical decisions. The development of clinical pharmacy in the hospital setting was one of the major strides in this direction (Leah, 1998).

Various attempts have been made to extend the role of the pharmacist all over the world. With the increasing complexity of therapy regimens and overwhelming numbers of patients, the pharmacist's role has expanded beyond dispensing medications, counseling on adverse effects, and monitoring for contraindications to include evaluation and initiation of new agents to optimize patient outcomes (Sisson and Kuhn, 2003). In U.K., the components of the pharmacist's extended role range from advising patients on minor ailments to diagnostic testing, health education and promotion, primary care and record keeping. In addition, in U.S.A., the development of the concept and practice of pharmaceutical care represents an attempt to provide the pharmacist with a more meaningful role, emphasizing the concept of caring and commitment to patient care (Leah, 1998). In line to this, many schools and colleges of pharmacy have adopted a patient-centered focus to their curriculum. This is in contrast to previous pharmacy curricula that were primarily focused on the pharmaceutical product and to some degree on clinical pharmacy activities (Siracuse, 2004).

Although pharmaceutical care is a widely accepted concept, many countries face different barriers for implementation and among the barriers shortage of pharmacists is in the forefront. Throughout the third world, whenever there are severe shortages of medical services there are

corresponding shortages of pharmaceutical services and of pharmacists and most of the people have no access to basic life saving drugs. At the same time, medicinal drugs are available in extensive open, unregulated markets. The shortage of pharmacists worsens the problem especially in the developing countries (WHO, 1988). Although the size of the pharmacy labor force in any sector depends on number of issues, due to the increasing demand for pharmacists in public health, WHO recommends a ratio of one pharmacist per 2000 population in order for optimal health care to be delivered (Chan and Wuliji, 2006; Pharmacy Education and Healthcare, 2007).

Studies showed that there is high variation in number of pharmacists in between and within countries (WHO, 1988). According to 2006 FIP report, the pharmacist to population ratios vary widely from less than 5 pharmacists per 100,000 populations to as high as over 200 pharmacists per 100,000 populations in some countries. The average ratio in the West Pacific countries is about 25 times more than that of the countries in the African region (Chan and Wuliji, 2006). Within countries, ratios may vary from 1:12,000 in the capital city to 1:700,000 or less in provinces, reflecting, and associated with, the shortage and maldistribution of professional health manpower in general, and the very low levels of socioeconomic development. This must be compared with an average ratio of around 1:2,300 in industrialized countries (WHO, 1988).

Pharmacists are experiencing increased demand for their services. Key factors contributing to the rising demand for pharmacists include migration (Wuliji *et al*., 2009), escalating number of women entering the profession who tend to choose part-time work (Hawthorne and Anderson, 2009; Walton and Cooksey, 2001), the increased use of pharmaceuticals resulting from the aging of the population (Chan and Wuliji, 2006; Hawthorne and Anderson, 2009; Maio *et al*., 2004; Mott et al., 2004), expansion of pharmacy practice and pharmacists‘ responsibilities, decline in pharmacy graduates, growing job opportunities for pharmacists in nontraditional settings, such as business, government, and wholesale trades. As a result, there is a persistent discrepancy between the demand for and the supply of pharmacists (Hawthorne and Anderson, 2009; Maio *et al*., 2004). The imbalance between supply and demand probably has affected the amount and type of work pharmacists perform in their work settings and has led to a consistent increase in the practice workload and to longer and less flexible working schedules current pharmacy practitioners experience (USA Department of Health and Human Services, 2000). Unfortunately,

if pharmacies remain overly busy and understaffed, a burdensome real-life workload can make conversations and information exchanges difficult to maintain. These all contributes for pharmacists to be dissatisfied with their job (Salameh and Hamdan, 2007).

The interaction between work environments, level of income (remuneration), age, gender, level of education, the amount and type of work pharmacists perform, relations with co-workers and other factors can influence pharmacists' job satisfaction (Carvajal and Hardigan, 2000; Hardigan and Carvajal, 2007; Mott *et al*., 2004; Seston *et al*., 2009). Individual dissatisfaction with work has long been associated with poor mental health, in particular with stress and anxiety. At organizational level it leads to low organizational effectiveness, absenteeism, high job turnover, and results in workers reducing their hours or completely withdrawing from the labor market (Seston *et al*., 2009). Thus, the degree of pharmacists‘ contentment with their profession is of great concern. Many studies have found that pharmacists experience high levels of stress in their daily professional duties that diminishes their quality of life on the job and greatly increases the likelihood of errors in dispensing medications. In a survey done for United States pharmacists, only 50% of respondents reported that they would choose their profession if they had to make the choice all over again (Maio *et al*., 2004).

The relationship between job satisfaction, job turnover intent, and actual job turnover has been explored widely in the psychological literature. Job turnover relates to a decision to leave one job for another. Researchers argued that individuals‘ demographic characteristics (age, sex, education, etc) influence whether they decide to stay or leave their job. Job satisfaction can also affect whether the individual considers leaving his/her job or not. Studies often measure turnover intentions in the absence of data on actual quitting behavior. This is in part due to lack of adequate longitudinal data but an intention to quit has in any case been shown to be a good predictor of actual employee turnover.

Currently, pharmacists have a higher job turnover rate than other sectors of economy. This high turnover rate is predominantly due to pharmacists‘ dissatisfaction with their work i.e. an increase in job satisfaction can reduce the likelihood of job turnover. Other factors that have been shown to affect pharmacist job satisfaction are pharmacists‘ perceived utilization of skills, staffing level adequacy and feelings about the types of activities performed at work along with the type of

practice setting (Kerschen *et al*., 2006). A study by Cox and Fitzpatrick investigated that there is a correlation between pharmacists‘ job satisfaction and perceived utilization of skills of pharmacists practicing in institutional and ambulatory care settings in Arizona. This study found that pharmacists were more satisfied when more clinical skills were used, when staffing was appropriate, and if they had a higher education (Cox and Fitzpatrick, 1999). So, studies in this field can help clarify the areas of pharmacy that need improvement, hopefully resulting in increased satisfaction and decreased turnover among pharmacists which assist in retaining productive and experienced pharmacists.

2.3. Human Resources for Health in Ethiopia

Despite the encouraging trends, Ethiopia still has one of the poorest health status in the world and the health service coverage is very low (El-Saharty *et al*., 2009; Chaya, 2007). The health care delivery system has historically been unable to respond qualitatively or quantitatively to the health needs of the people i.e. the country not only suffers from low level of health service coverage but also from low quality of health care services. Furthermore, the level of utilization of the health care services by the people is very low although the development in services utilization is encouraging (FMOH, 2006b). A study on health service utilization in Amhara region of Ethiopia showed that only 59% of the reported deaths visited health institutions for the killer disease. And of those who claimed to be sick over the two weeks period preceding the survey, 38.7% visited health institutions. The most important reason for not visiting health institutions were: belief that the disease did not need treatment in health institutions, buying drugs from drug vendors and visiting traditional healers (Fantahun and Degu, 2003).

As in most developing countries, Ethiopia's main health problem is communicable disease, potentially preventable. However, during the past few years, non-communicable diseases have emerged as important clinical and public health problems. WHO estimated that the number of cases of diabetics in Ethiopia to be about 800,000 in 2000, and projected that it would increase to about 1.8 million by the year 2030 (Feleke and Enquselassie, 2005). Aggravating these states of affairs are, the rapidly growing population, shortage of trained human-power and the lack or inadequate infrastructures which contribute to the general well being of the population. Above all,

most sounding health institutions are concentrated in urban centres while 85% of the populations are rural (Dejene, 2003; Feleke and Enquselassie, 2005).

The changes in the practice of pharmacy, combined with an aging society with chronic diseases and newly approved medications, result in the need for a significantly expanded pharmacist work force with appropriate education and training. However, the role of pharmacist in Ethiopia is still lagging behind. Pharmacists are working as compounder and supplier of pharmaceuticals which is considered as the traditional role of pharmacists. Taking these realities, the schools of pharmacy of Ethiopia united to take responsibilities in enhancing the role of pharmacists towards that of a provider of services and information and ultimately that of a provider of patient care. All schools of pharmacy in the country revised the old curriculum which was more of product oriented. As a result, Students are now taking training with the new curriculum which focuses more on the new dimension of pharmacy practice called pharmaceutical care. Thus, pharmacy is developing new services in line with government policy around increasing access to health care and enabling patients to make better use of services, mainly through local pharmaceutical services (Addis Ababa University, 2009).

With regard to HRH, different studies show that the manpower in the health service is very small in number, underutilized in some cases and does not have the appropriate level and mix of skills. In a study of health situation in Ethiopia, it has been shown that the chronic shortage of health professionals where the density of professionals to population found to be 1: 24,841, 1:11,000, 1:84,615 for physician, nurse and pharmacists, respectively (Dejene, 2003). This ratio of pharmacists to population is much less than other countries like Kenya (8 pharmacists per 100,000 population), Ghana (10 pharmacists per 100,000 populations), Egypt (125 pharmacists per 100,000 populations) and Malta (206.67 pharmacists per 100,000 population) (Chan and Wuliji, 2006; FIP, 2009; WHO- EMRO, 2005). There is a relative shortage of front line and middle level professionals resulting in non-ideal ratio between doctors and other professionals (Dejene, 2003). All these factors, in addition to the lack of appropriate career structure and incentive schemes, have created a body of professionals who are mismanaged, disinterested, unsympathetic and unethical (Abula and Ashagrie, 2003; Fantahun, 2005; Feleke and Enquselassie, 2005).

On the other hand, the country is aiming to be a middle income country by 2025 and is one of the countries striving to meet MDGs (Adugna, 2010). But this couldn‘t be possible unless the country has a healthy society. In many countries, pharmacists are the most accessible of all healthcare workers and as such play a key role in the delivery of healthcare services at all levels. As health care professionals, they have an indispensable contribution in achieving the health sector MDGs and hence help ensuring a healthy society. However, despite considerable growth in the number of pharmacists in recent years, it is less than the number required when we compare it with the population size. The shortage might be even more alarming in the future with current mission shifts in pharmacy practice where it is becoming diversified and more and more involved in patient care than ever. Involving pharmacists in providing patient oriented services not only increased the quality of medical care at tertiary level but help to expand the primary health coverage as most illness complaints could be handled by either non drug or over the counter drug therapy. This is pretty much in line with the country‘s health policy which focuses on the primary health care.

Although most developed countries have a well documented data of health workers and pharmacy workforce in particular, the developing world like Ethiopia are severely lagging in developing an evidence base related to its education and work-force development. The country lacks an adequate national pharmacy workforce data. As a result, fundamental questions regarding the status of the pharmacy workforce, its level of performance and the problems they face remain largely unanswered. So, result of this unique national survey allows in critical evaluation of the national pharmacy workforce which should be considered in the national health care policies and workforce planning that impact the health, labor and education policies.

3. Objectives of the Study

3.1. General Objective

- To assess pharmacy workforce in Ethiopia.

3.2. Specific Objectives

- To determine density of pharmacists per 100,000 population
- To compare level of distribution of pharmacists by region
- To predict demand of pharmacist by 2024/25
- To determine loss rate of pharmacists‘
- To assess level of job satisfaction and plan to change work-life of pharmacists

4. Materials and Methods

4.1. Description of the Study Site

Ethiopia is a landlocked country situated in the Horn of Africa. With a total area of around 1.12 million square kilometers, it borders with five countries - Eritrea in the north, Sudan in the west, Kenya in the south, Somalia in the east and Djibouti in the north-east, (CSA, 2008; FMOH, 2006). The country has nine regions and two city administrations. According to the 2007 population and housing census, Ethiopia has a total population of 73.9 million; of whom 50.5% are males and 49.5% are females. Majority of the population (83.8%) is engaged in agriculture, mainly in subsistence and rain-fed farming and livestock production (CSA, 2008).

Ethiopia experiences a heavy burden of disease with a growing prevalence of communicable and chronic diseases (El-Saharty *et al*., 2009). These problems are exacerbated by the shortage of trained manpower and health facilities. According to recent report by the Ministry of Health, the country has a total of 195 hospitals, 1,362 health centers, 2,151 physicians, and 20,109 nurses (FMOH, 2009). Data related to pharmacy was not documented in the 2009 health and health related indicators but the 2008 report indicated that there were 178 pharmacies and 259 drug stores (FMOH, 2008).

4.2. Study Design

The study was based on census and cross-sectional survey. Both qualitative and quantitative methods were employed in data collection and the two approaches were arranged to complement each other. Document review was done to get data on the list of graduated pharmacists and Ethiopia GDP per capita. A literature search was also done to get figures on other countries GDP per capita and pharmacist density. The data collection was conducted between May and September, 2010.

4.3. Source and Study Population

All pharmacists in the regions and city administrations who were actively practicing within the profession were a source of population for study. A national census survey of pharmacists was

conducted in all pharmaceutical sectors across the country. Variables related to pharmacists‘ job satisfaction and work-life change were assessed taking cross-section of the pharmacists by applying stratified random sampling method. The number of pharmacists to participate in the study from each region/city administration was decided based on proportionate to size. In addition, in-depth interview was conducted on selected key informants from FMOH, RHBs and pharmacists from different batches (graduates of 1992 to 2005)

4.4. Sampling and Sample Size Determination

National Census and Cross-sectional Survey

The population size for the national census was all pharmacists who were actively practicing in the country. To assess the job satisfaction and work-life change of pharmacists, the regions and city administrations were stratified based on their level of development into historically disadvantaged (emerging) regions and other regions/city administrations (Annex-I). Of the nine regions and two city administrations, the study was conducted in Addis Ababa, two historically disadvantaged regions (Afar and Benshangul Gumuz), and three other regions (Amhara, Oromia and Tigray). Addis Ababa was selected purposively due to the fact that almost half of the pharmacists in the country were working in the capital city. The two historically disadvantaged regions and three other regions were selected using stratified simple random sampling.

The cities/towns selected for the study were: Mekelle, Adigrat, Axum, Wukro, Humera and Dansha from Tigray; Adama, Bishoftu, Nekemtte, Shashemene, Jimma, Ambo, Fiche, Limugenet, Gindbiret, Dembidello, Gimbi, Nejo, Begii, Arsirobe and Yabello from Oromia; Bahir Dar, Dessie, Debremarkos, Deberebirhan, Gondar, Debretabor, Weldia, Finoteselam, Borumeda, Sekota, Motta, Metema and Lalibela from Amhara; Semera and Dupti from Afar; and Assossa from Benshangul Gumuz. The study cities/towns of the regions were selected purposively to include pharmacists from both remote and urban areas. Purposive sampling of cities/towns was used due to the reason that the level of job satisfaction might differ with level of development of the cities/towns. The number of pharmacists to be selected from each city/town was done using quota sampling method.

The sample size for the cross-sectional survey was calculated using a single proportion formula (Lwanga and Lemeshow, 1991);

$$N = \frac{(Z_{\alpha/2})^2 * P(1-P)}{D^2}$$ Where;

N = Desired sample size

$Z_{\alpha/2}$ = 1.96 (critical value at 95% confidence level of certainty)

P = Level of job satisfaction (50% is preferred to obtain the largest possible sample size)

D = Margin of error between the sample and population, 5% marginal error is admitted

$$N = \frac{(1.96)^2(0.5)(1-0.5)}{(0.05)^2} = 384$$

The sample size was calculated to be 384. The sample size was calculated assuming the expected pharmacists' satisfaction level to be 50%, sampling error 5% and with 95% confidence interval. Taking the assumption of 10% none and inappropriate responses and adding with the desired sample size calculated above, then the number of pharmacists included in the study was determined to be 422.

Key Informant Interview

The selection of key informants from RHBs and FMOH was based on purposive sampling to address different issues related to pharmacy workforce. An interview with seven key informants (two from the FMOH, five from the regions and city administration) was done by the principal investigator and his assistants. The study also involved pharmacists graduated between 1992 and 2005. The selection of pharmacists from each batch for the interview was done based on snowball or chain sampling method and an interview was done with 35 pharmacists (three or two pharmacists from each batch).

4.5. Data Collection and Management

4.5.1. Data Collection

Fifty three pharmacists were recruited as data collectors and prior to data collection, training was given for the data collectors. The training focused on aim of the study and detailed review of the data collection instruments. This involved detailed presentation and discussion of the tools in English since the self administered questionnaire were in English. The training was followed by pre-testing of the tools in different areas of pharmacy practice. Both the investigator and the data collectors discussed lessons learnt from the pre-test to help further modify the tools and further clarify some of the issues. The following week, the tools were finalized and sent to all study sites for data collection.

Data was collected by the principal investigator and trained data collectors. The principal investigator together with assistants conducted the key informant interview and document review. The trained data collectors were responsible to conduct complete enumeration of pharmacists and collect the self administered questionnaires from the selected study cities/towns under the supervision of the principal investigator. In addition, the principal investigator checked the completeness of collected data.

4.5.2. Data Collection Instruments

National Census and Cross-sectional Survey

In the census survey, information about the pharmacists‘ sex, current area and region of practice were gathered using a data collection form (Annex-II).

For the cross-sectional survey, a slightly modified version of the RPSGB (Royal Pharmaceutical Society of Great Britain) used with pharmacists and Minnesota studies in vocational rehabilitation job satisfaction scale were used to measure job satisfaction of pharmacists (Hassell *et al*., 2006; University of Minnesota, 1967) (Annex-III). The self administered questionnaire includes questions on the pharmacists‘ socio-demographic characteristics (age, sex, marital and

education status), area of practice, average daily working hours, work experience, continuing pharmacy education (CPE), job satisfaction and plan to change work-life.

In the questionnaire used to assess pharmacists' job satisfaction, while one item measures overall job satisfaction, other items measure satisfaction with particular aspects of work, such as: physical working conditions, work load and staffing adequacy, remuneration, amount of responsibility they were given, opportunity to use their abilities, freedom to choose their own method of working, relation with colleague and fellow professionals, recognition they get for good work, the way institutional policies were put into practice etc. Each item was rated on a five-point scale from 1 (very dissatisfied) to 5 (very satisfied). Since all of the statement were positively worded, smaller mean values showed lesser satisfaction and a high score indicated higher satisfaction.

A measurement scale used by the RPSGB (Hassell *et al*., 2006) was also used to measure the likelihood of pharmacists in making changes to their work-life within the next two years (Annex –III). Three items (leaving the current area of practice, reducing work hours and leaving the profession altogether) were included to assess about possible changes that pharmacists might make over the next two years to their work life. To all the items, a response of 4 or 5 (high likely or very high likely) were combined to indicate whether the pharmacists were ‗highly likely' to change their work-life while responses other than this were considered that it was unlikely that the respondents would change their work-life.

Key informant interview

This involved the use of semi-structured, open-ended interview guide with flexible probing techniques to investigate policy makers opinion and experience about pharmacy practice/profession, government responsibility in promoting the effective utilization of the profession and creating conducive environment for patient centered pharmacy practice, and if there is any future plan to maximize patients' benefit from the underutilized pharmacy profession (Annex-IV and Annex-V). It also investigate their perception on the pharmacists' responsibility or scope of practice. Socio-demographic data which includes gender, level of training and qualification, and years of experience in the current position were collected prior to the

interview. The duration of the interview was approximately thirty minutes. To facilitate the interview process the interview was done in Amharic and all the interviews (except one) were tape recorded and transcribed word by word.

Document Review

Review of documents was done to get information on the list of graduated pharmacists (1992 to 2005) and this data was obtained from Addis Ababa University, Registrar Office. Ethiopian GDP per capita for the last nine years (1990/00 to 2008/09) was obtained from the Federal Ministry of Finance and Economic Development (FMOFED). In addition, a literature search was done to get information about other countries GDP per capita and pharmacists' density per population. Countries name, GDP per capita, pharmacist size, pharmacist density or ratio were the key words used for the literature search. The data obtained from document review and literatures were recorded in the data abstraction format (Annex-VI).

4.6. Study Variables

Determine the density of pharmacists per 100,000 populations

Independent Variables: Population size, number of actively practicing pharmacists

Dependent Variable: Density of pharmacists per 100,000 population

The future demand of pharmacist by 2024/25

Independent Variables: Number of actively working pharmacists, population size, GDP per capita

Dependent Variable: Demand of pharmacist by 2024/25

Determine pharmacists' loss rate

Independent Variables: Annual loss and annual gain of pharmacists

Dependent Variable: Pharmacists' Loss rate

Assess level of job satisfaction and plan to change work-life of pharmacists

Independent Variables: Sex, age, level of education, marital status, years of professional work experience, average hours of work, area of pharmacy practice, region of practice, level of development of the practicing city/town

Dependent Variables: Pharmacists' level of job satisfaction and plan to change work-life

4.7. Data Entry, Clean up and Analysis

Data entry for the census and cross-sectional survey was done using Epi Info version 6.04 and data was analyzed using SPSS Version 15. Descriptive statistics including mean and standard deviations were computed for the survey data. Association between pharmacists' job satisfaction and demographic variables were explored using student's t-test and one-way ANOVA. Association between pharmacists' work-life change and demographic variables were analyzed using X^2- test.

Data entry, checking and analysis for the loss rate, projection of population size and pharmacists density was done using MS Excel. The personnel (pharmacist) to population ratio method was employed to forecast pharmacists' density of the next fifteen years. WHO recommended ratio of one pharmacist per 2000 population (Pharmacy Education and Healthcare, 2007), average African countries pharmacists' density (8 pharmacists per 100,000 population) (Dayrit *et al.,* 2006) and ratio which considers the GDP per capita of the country were devised as a method to project the required number of pharmacists.

To determine the number of pharmacists, the population of Ethiopia for 2010 was determined based on the 2007 population and housing census results (CSA, 2008). The population size of 2007 was then projected using the specified annual population growth rate for each region and at country level. Projection of pharmacists for the next fifteen years was done based on the forecasted GDP per capita and projected population sizes of the country. Based on the previous annual GDP per capita, annual growth rate of GDP per capita (AGRG) was calculated for the nine consecutive years using the formula below (Eq.1) (McBride, 2010) and using the average annual growth rate of GDP per capita, forecasting of Ethiopia GDP per capita was done for the

next fifteen years. Forecasting demand of pharmacists was also done using the two derived equations. In addition, significance of R^2 for both equations was determined using student's t-test.

$$AGRG = \frac{\text{GDP per capita of present year} - \text{GDP per capita of previous year}}{\text{GDP per capita of previous year}} \times 100 \quad \text{.....Eq.1}$$

To calculate the national annual loss rate (ALR) of pharmacists since 1993 till 2006, the following equation was used (Berhan, 2008).

$$ALR = \frac{(\text{Previous year count} + \text{New graduate}) - \text{Current count}}{\text{Previous year count} + \text{New graduate}} \times 100 \quad \text{.....Eq.2}$$

Qualitative data were analyzed manually using thematic analysis approach. Initial categories for analyzing data were drawn from the interview guide and themes and patterns emerged after reviewing the data. Key themes to emerge were: availability and importance of job description, overall contribution of pharmacists to the health care team, difference between pharmacists and other pharmacy personnel based on level of training and actual practice, government responsibility on the new pharmacy curriculum, distribution of pharmacist among regions, availability of pharmacists in all health institutions where pharmacists are supposed to be present based on the recommendation of the FMOH and reasons for failing to employ pharmacists by the regions and city administrations.

4.8. Ethical Considerations

Approval of the research was obtained from School of Pharmacy, Addis Ababa University Ethics Review Committee and respective RHBs. Participants were provided with information regarding the purpose of the study, what is expected from them, and how they can benefit from the study result. Each participant was also informed that the participation in the study was voluntary and

s/he could withdraw at any time, and the withdrawal of consent would not affect his/her relation with the institution or any other person. In addition, participants were assured about confidentiality of the information obtained and were informed that the information used will only be accessible to the research team.

4.9. Operational Definitions

- **Continuing Pharmacy Education**: a structured process of education designed or intended to support the continuous development of pharmacists to maintain and enhance their professional competence.
- **Job satisfaction:** an individual‘s judgment about the extent to which the job provides a pleasurable level of fulfillment or the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs.
- **Loss rate:** attrition of professionals due to death, retirements, migration, withdrawal from the workforce prior to retirement and changes in profession.
- **Pharmacy workforce**: includes all pharmacy staffs awarded with a degree in pharmacy or above from an accredited university/college.
- **Sales and marketing**: area of pharmacy practice which comprises pharmaceutical importers, wholesalers and promoters.

5. Results

5.1. Findings from Census and Document Review

5.1.1. Socio-demographic Characteristics and Pattern of Practice

The first census of pharmacist's practicing in all regions/city administrations of Ethiopia undertaken in May to September 2010 revealed that the total number of pharmacists in the country was 1898. As shown in Table 5.1, at the country level the proportion of male pharmacists 1474 (77.6%) was much higher than female pharmacists 424 (22.4%). The variation in gender composition was also evident within the regions/city administration where in all regions/city administrations the proportion of male pharmacists exceeds that of females. Compared to other regions, the proportion of female pharmacist was considerably higher in Harar 9 (37.5%) followed by Addis Ababa 276 (31.7%).

The census also showed that there were significant variations in the distribution of pharmacists by regions/city administrations. Accordingly, the largest proportion 871(45.9%) of the country's pharmacy workforce was found in Addis Ababa followed by Oromia 355(18.7%) and Amhara 293(15.3) Regions. The lowest proportion was in Benishangul Gumuz Regional State which accounted only 5 (0.3%) of the country's pharmacist.

Regarding the pattern of practice, respondents who were actively practicing pharmacy were asked to report the area of practice they were working during the time of census. As can be seen in Table 5.2, hospital pharmacy accounted the largest proportion of pharmacists 638 (33.6%) followed by sales and marketing 356 (18.8%) and community pharmacy 351(18.5%). Slightly more than half (52.1%) of the pharmacists were working in two areas of practice, namely hospital and community pharmacies. In the capital city, however, the proportion of pharmacists working in sales and marketing constituted the largest share, 265 (30.4%). Higher proportion of female pharmacists than males were working in hospital (37.3% Vs 32.6%) and community pharmacy (26.4% Vs 16.2%). However, proportion of male pharmacists was higher in the remaining area of practice, the highest being in sales and marketing 285 (19.3%).

Table 5.1: Distribution of Actively Practicing Pharmacists by Region/City Administration and Gender, Ethiopia, 2010.

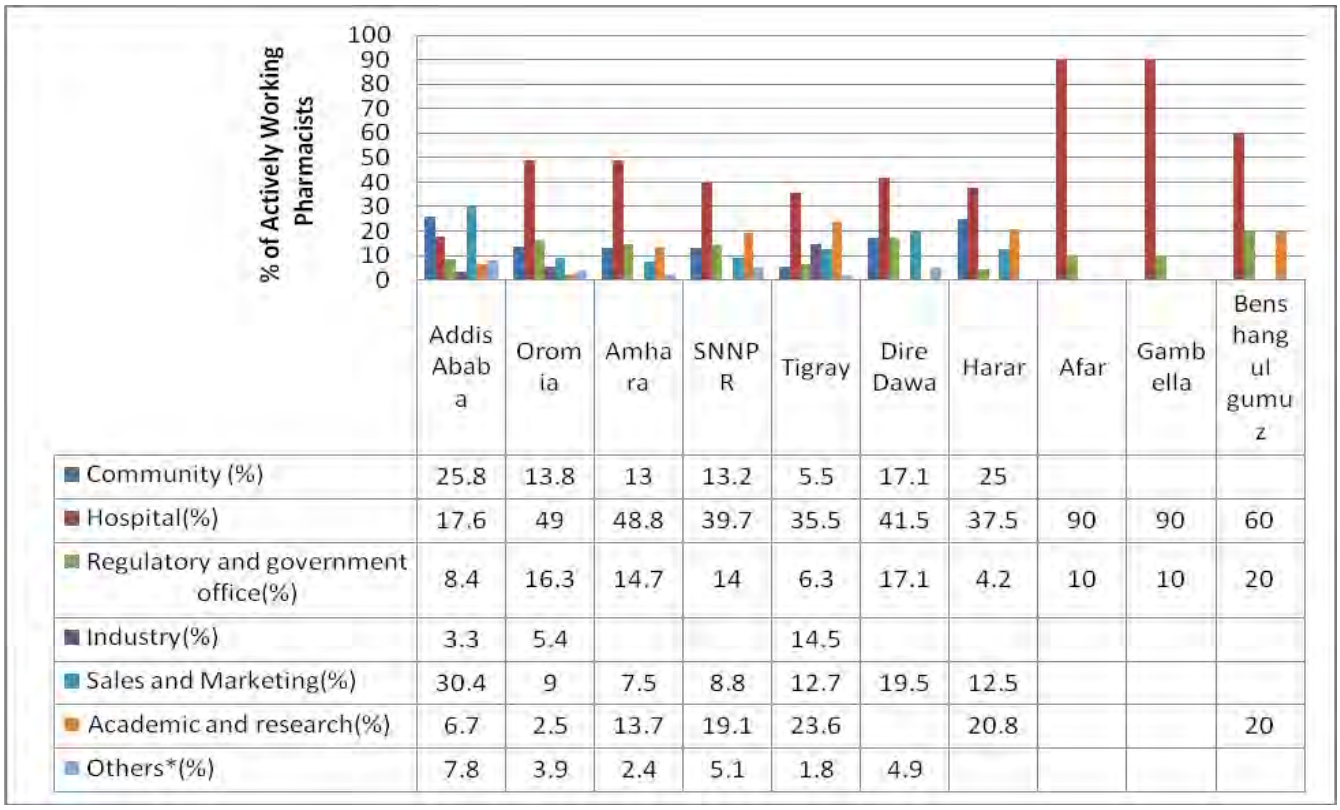
Region of practice	Male, N (%)	Female, N (%)	Male +Female, N (%)
Addis Ababa	595 (68.3)	276 (31.7)	871 (45.9)
Oromia	306 (86.2)	49 (13.8)	355 (18.7)
Amhara	241 (82.3)	52 (17.7)	293 (15.3)
SNNPR	123 (90.4)	13 (9.6)	136 (7.2)
Tigray	95 (86.4)	15 (13.6)	110 (5.8)
Dire Dawa	37(90.2)	4 (9.8)	41 (2.2)
Harar	15 (62.5)	9 (37.5)	24 (1.3)
Afar	9 (90)	1 (10)	10 (0.5)
Gambella	9 (90)	1 (10)	10 (0.5)
Benishangul Gumuz	5 (100)	0 (0)	5 (0.3)
Somali	39 (90.7)	4 (9.3)	43 (2.3)
Country Total	1,472 (77.6)	424 (22.4)	1898 (100)

Table 5.2: Proportion of Actively Practicing Pharmacists by Area of Practice and Gender, Ethiopia, 2010.

Area of practice	Male N (%)	Female N (%)	Male + Female N (%)
Community	239 (16.2)	112 (26.4)	351(18.5)
Hospital	480 (32.6)	158 (37.3)	638 (33.6)
Regulatory and Government Office	171(11.6)	43 (10.1)	214 (11.5)
Industry	55 (3.7)	9 (2.1)	64 (3.4)
Sales and Marketing	285 (19.3)	71 (16.7)	356 (18.8)
Academic and Research	159 (10.8)	16 (3.8)	175 (9.1)
Others*	85 (5.8)	15 (3.6)	100 (5.1)

** Consultancy, administrative office other than government*

Slightly more than half (53.7%) of the pharmacists in Ethiopia were working in public/government organizations and 745 (39.3%) of the pharmacist were either working in private sectors or self employed. The rest 134 (7.1%) of the pharmacists were working in NGOs including civic organizations, red cross, extraterritorial agencies which include UN agencies, AU, EU, bilateral donors and diplomatic missions.



	Addis Ababa	Oromia	Amhara	SNNPR	Tigray	Dire Dawa	Harar	Afar	Gambella	Benshangul gumuz
Community (%)	25.8	13.8	13	13.2	5.5	17.1	25			
Hospital(%)	17.6	49	48.8	39.7	35.5	41.5	37.5	90	90	60
Regulatory and government office(%)	8.4	16.3	14.7	14	6.3	17.1	4.2	10	10	20
Industry(%)	3.3	5.4			14.5					
Sales and Marketing(%)	30.4	9	7.5	8.8	12.7	19.5	12.5			
Academic and research(%)	6.7	2.5	13.7	19.1	23.6		20.8			20
Others*(%)	7.8	3.9	2.4	5.1	1.8	4.9				

** Consultancy, administrative office other than government*

Figure 5.1. Proportion of Actively Working Pharmacists by Region/City Administration and Area of Practice, Ethiopia, 2010.

5.1.2. Density of Pharmacists per 100,000 Population

This study showed that there was a big variation in density of pharmacists among the regions and city administrations (Table 5.3). The highest density of pharmacist per 100,000 population was recorded in Addis Ababa (29.88) and the lowest was in Afar which was 0.66 pharmacists per 100,000 population. The national density of pharmacists per 100,000 population was calculated to be 2.38.

Table 5.3. Density of Pharmacists per 100,000 Population by Region/City Administration, Ethiopia, 2010.

Region/City Administration	Total Number of Pharmacists	Population Size	Density of Pharmacists per 100,000 Population
Addis Ababa	871	2,914,406	29.88
Oromia	355	29,590,044	1.20
Amhara	293	18,106,982	1.62
SNNPR	136	16,389,550	0.83
Tigray	110	4,647,222	2.36
Dire Dawa	41	369,187	11.11
Harar	24	198,020	12.12
Afar	10	1,506,288	0.66
Gambella	10	346,236	2.89
Benishangul Gumuz	5	733,053	0.68
Somali	43	4,794,481	0.90
Country Total	1898	79,835,354	2.38

5.1.3. Forecasting the Required Number of Pharmacists for Ethiopia

5.1.3.1. Based on WHO Recommended Ratio and African Countries Average Density of Pharmacists

According to WHO recommended ratio of pharmacists per population (1 pharmacists per 2000 population) (Pharmacy Education and Healthcare, 2007), Ethiopia with a population size of 79,835,354 requires a total of 39,918 pharmacists in order to deliver quality pharmaceutical services.

Based on the average African countries density of pharmacists scenario, which is 8.0 pharmacists per 100,000 population (Dayrit *et al*., 2006), the current demand of pharmacists for Ethiopia is calculated to be 6,387.

5.1.3.2. Forecasted Demand of Pharmacists Based on GDP per Capita

Pharmacist density which considers the GDP per capita of the country was devised as a method to project the required number of pharmacists. Other countries' (lower, middle and higher income countries by World Bank income classification) GDP per capita and pharmacists' density were used in deriving the equations which were helpful in forecasting the demand of pharmacists for Ethiopia. As shown in Figure 5.2 and 5.3, analysis of secondary data (Annex-VI) revealed that pharmacist to population ratio significantly increase as GDP per capita increases. In both cases, the GDP per capita is significantly a strong predictor of pharmacist density, $R^2 = 0.916$, $P< 0.001$ for the lower and middle income country scenario and $R^2 = 0.7705$, $P< 0.001$ for the lower, middle and high income country scenario. Hence, the projection of pharmacists for the next fifteen years was done based on the forecasted GDP per capita and projected population sizes of the country.

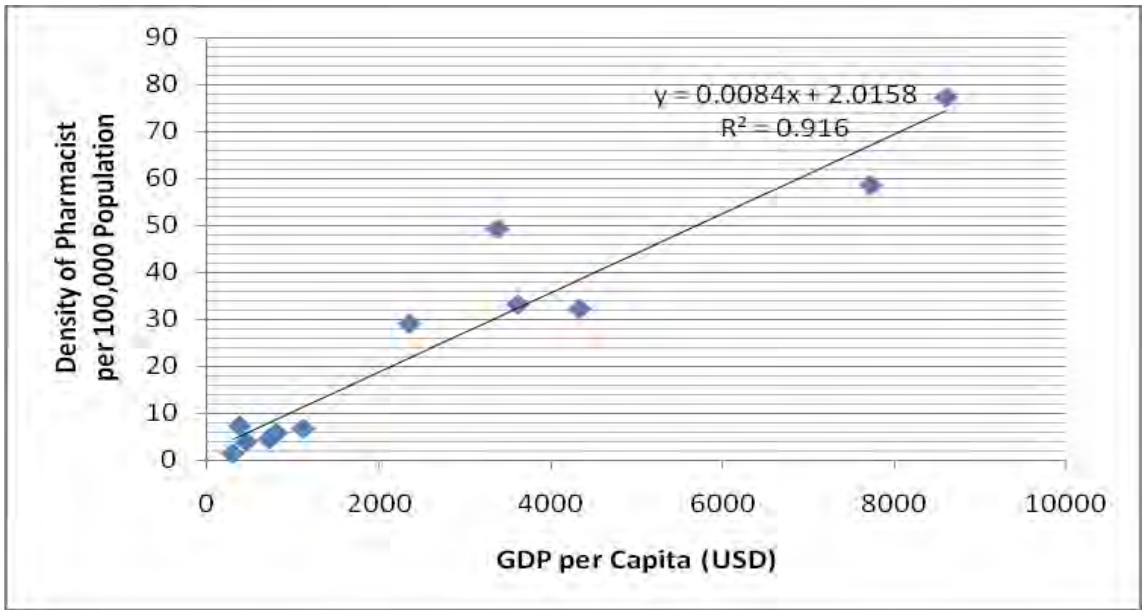


Figure 5.2. Pharmacists' Density versus GDP per Capita (USD) of the Lower and Middle Income Countries.

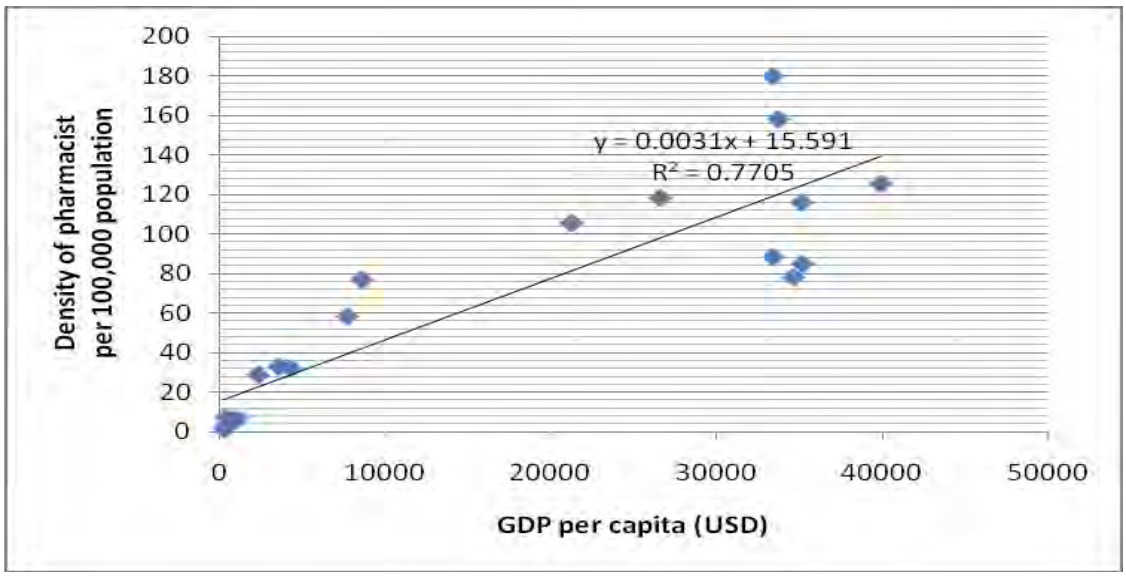


Figure 5.3. Pharmacists' Density versus GDP per Capita (USD) of the Lower, Middle and Higher Income Countries.

According to FMOFED, the GDP per capita (USD) of Ethiopia in1999/00, 2000/01, 2001/02, 2002/03, 2003/04, 2004/5, 2005/6, 2006/7, 2007/8, 2008/9 fiscal year was reported to be 136, 133, 123, 132, 151, 180, 217, 270, 359, and 420 respectively (FMOFED, 2010). Based on these previous annual GDP per capita, annual growth rate of GDP per capita was calculated for the nine consecutive years and results were -2.2%, -7.5%, 7.3%, 14.4%, 19.2%, 20.6%, 24.4%, 33%, and 17% for the fiscal year of 1999/00, 2000/01, 2001/02, 2002/03, 2003/04, 2004/05, 2005/06, 2006/07, 2007/08, and 2008/09 respectively. Thus, the average annual growth rate of GDP per capita was calculated to be 12.7%. Using the average annual growth rate of GDP per capita, forecasting of Ethiopia GDP per capita was done for the fifteen years and results are presented in Table 5.4.

Based on the relationship obtained between GDP per capita and pharmacist density of the lower and middle income countries scenario, Ethiopia needs 5,249 pharmacists (6.49 pharmacists per 100,000 population) for the 2010/11 fiscal year. The demand of pharmacists for the same fiscal year is 13,942 (17.24 pharmacists per 100,000 population) when it is forecasted based on the relationship of GDP per capita and pharmacist density of the lower, middle and higher income countries scenario. In both cases, the demand for pharmacist increase with increasing GDP per capita of the country and in 2024/25 fiscal year, the GDP per capita (USD) of Ethiopia is

expected to be 2,843, while the number of pharmacists required within that fiscal year is nearly from 28,278 (lower and middle income countries scenario) to 30,003 (lower, middle and higher income countries scenario) (Table 5.4).

Table 5.4. Fifteen Years Forecasted Demand of Pharmacists for Ethiopia Based on Forecasted GDP per Capita and Projected Population Size, Ethiopia, 2010.

Fiscal Year	Forecasted GDP Per Capita (USD)	Projected Population Size	Forecasted Density of Pharmacist [a]	Forecasted Number of Pharmacists [a]	Forecasted Density of Pharmacist [b]	Forecasted Number of Pharmacists [b]
2010/11	533	80,873,214	6.49	5,249	17.24	13,942
2011/12	601	82,975,918	7.06	5,859	17.45	14,479
2012/13	677	85,133,292	7.70	6,556	17.69	15,060
2013/14	763	87,346,757	8.43	7,364	17.96	15,687
2014/15	860	89,617,773	9.24	8,281	18.26	16,364
2015/16	969	91,947,835	10.20	9,379	18.59	17,093
2016/17	1,092	94,338,479	11.19	10,557	18.98	17,905
2017/18	1,231	96,791,279	12.36	11,964	19.41	18,787
2018/19	1,387	99,307,853	13.67	13,575	19.89	19,752
2019/20	1,564	101,889,857	15.15	15,437	20.44	20,826
2020/21	1,762	104,538,993	16.82	17,584	21.10	22,057
2021/22	1,986	107,257,007	18.70	20,058	21.75	23,328
2022/23	2,238	110,045,689	20.82	22,912	22.53	24,793
2023/24	2,522	112,906,877	23.20	26,195	23.41	26,431
2024/25	2,843	115,842,456	25.90	30,003	24.41	28,278

[a] *forecasting based on low and middle income countries GDP per capita and pharmacist density.*

[b] *forecasting based on low, middle and high income countries GDP per capita and pharmacist density.*

5.1.4. National Loss Rate/Attrition Rate of Pharmacists in Ethiopia

As shown in Figure 5.4, the trend of annual loss rate (ALR) of pharmacists from 1993 to 2006 at the national level appears to be like a wave with variable amplitude. The ALR of pharmacists' was decreasing starting from 1993 to 1997 but it started to increase in the periods between 2000 and 2005 (Figure 5.4). The 1993 fiscal year was a time where the highest pharmacists' loss rate was recorded, which was 31.8%. The lowest pharmacists' loss rate was recorded in 1997 which was 1.7%. The average annual attrition rate of the fourteen years (1993-2006) was calculated to be 6.5%.

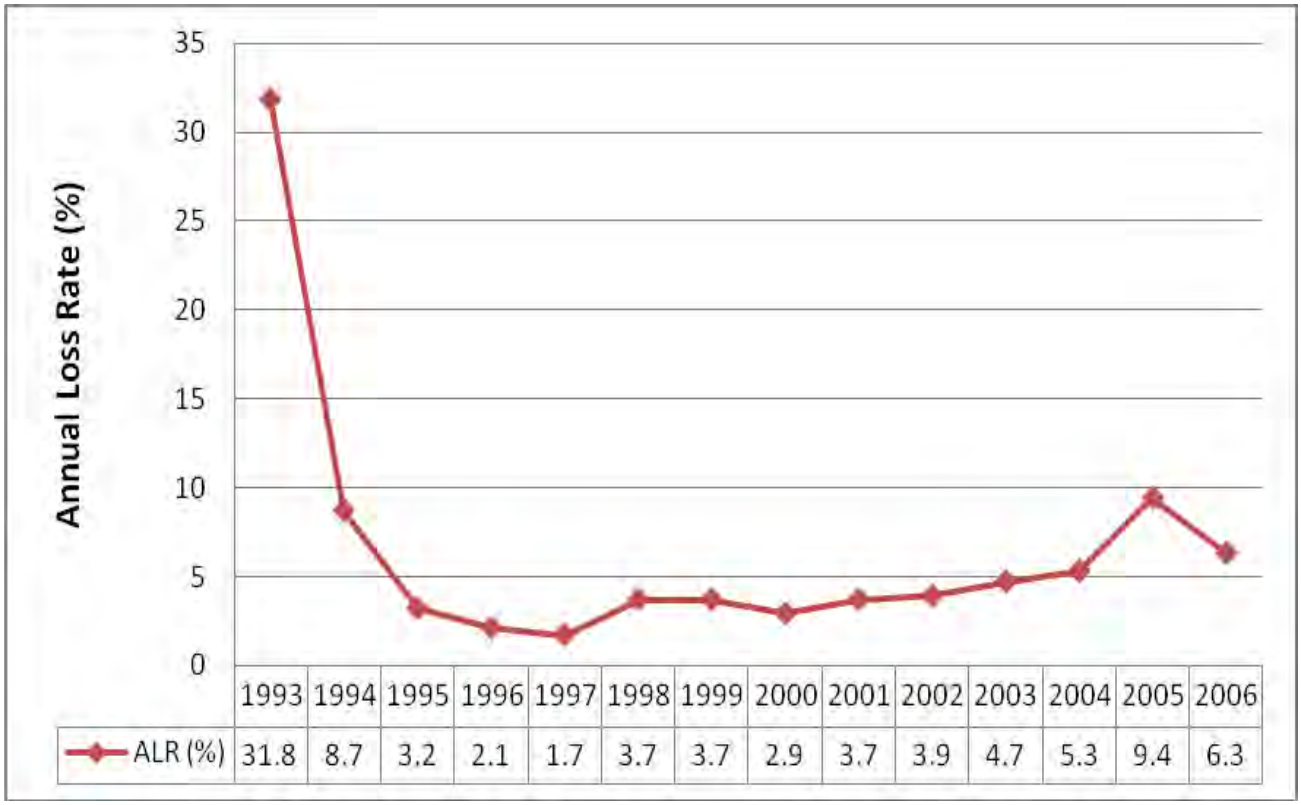


Figure 5. 4. Pharmacists' Annual Loss Rate in Ethiopia (1993 - 2006).

5.2. Findings from the Cross-sectional Study

5.2.1. Socio-demographic Characteristics of Respondents

A total of four hundred twenty two self administered questionnaires were distributed to pharmacists practicing in five regions and one city administration. Two hundred twenty four (53.2%) of the questionnaire were distributed in Addis Ababa and the rest were distributed in Oromia 91 (21.6%), Amhara 75 (17.7%), Tigray 28 (6.8%), Afar 3 (0.7%), and Benshangul gumuz 1 (0.2%). Of the 422 study participants**,** 393 pharmacists returned the questionnaire making the response rate of the survey 93.2%. The mean age of the pharmacists was 30.2 years (SD = 8.3, range: 21 to 63 years). Two hundred forty eight (64.1%) of the respondents had age of 30 years and below and the majority of the study participants were degree (B.Pharm) holders, 347 (88.3%). Male pharmacists were older than female pharmacists (30.8 years compared with 28.9 years). About two-third (64.1%) of the pharmacists were single and 136 (34.6%) were married (Table 5.5).

The majority 376 (98.9%) of the participants were full time workers and the remaining 4 (1.1%) reported that they were par time workers. Of the employed workers, more than half (67.1%) of them mentioned that they were government employee followed by 88 (23.9%) private employee, 28 (7.6%) NGO employee and 5 (1.4%) self employed. From the actively employed pharmacists, slightly higher than half 199 (50.6%) reported working in level I city while the others 56 (14.2%), 92 (23.4%) and 46 (11.7%) were working in level II, level III and level IV cities/towns, respectively.

The average number of years in professional job for the pharmacist was 5.8 years (SD = 7.3) and the average number of years at current job was 3.6 (SD = 4.5). The average number of hours worked per week in his/her main job was 46.3 (SD = 11.6).

Table 5.5.Socio-demographic Characteristics of Respondents (N= 393*), Ethiopia, 2010.

Socio-demographic Profile		N (%)
Age	≤ 30 years	248 (64.1)
	31-40 years	88(22.7)
	> 40 years	51(13.2)
Marital Status		
	Single	252(64.1)
	Married	136(34.6)
	Divorced	3(0.8)
	Widowed	2(0.5)
Education		
	B.Pharm (BSc in Pharmacy)	347(88.3)
	MSc in Pharmacy	45(11.5)
	Others**	1(0.3)
Professional Work Experience		
	< 5 years	260(68.2)
	5-10 years	58 (15.2)
	>10 years	63(16.5)
Working City/Town		
	Level I[a]	199(50.6)
	Level II[b]	56(14.2)
	Level III[c]	92(23.4)
	Level IV[d]	46(11.7)

**Some missing Values* ** *PhD*

[a] *Addis Ababa* [b] *Mekelle, Adama and Bishoftu and Bahir Dar*

[c] *Adigrat, Axum, Wukro, Nekemtte, Shashemene, Jimma, Ambo, Fiche, Dessie, Debremarkos, Deberebirhan, and Gondar*

[d] *Humera, Dansha, Limugenet, Gindbiret, Dembidello, Gimbi, Nejo, Begii, Arsirobe, Yabello, Debretabor, Weldia, Finoteselam, Borumeda, Sekota, Motta, Metema, Lalibela, Semera, Dupti, Assossa*

5.2.2. Opportunities for Continuing Pharmacy Education

From the total of three hundred eighty six actively working pharmacists, only 122 (31.6%) mentioned that they have had CPE; while the rest 264 (68.4%) reported that they have never had any CPE since they graduated. Of those who claimed to have had the CPE, 43 (35.2%) reported that they took it in a period of less than six months preceding the interview date, 26 (21.3%) six months to 1 year and 53 (43.4%) took before more than a year. Majority of the professionals 117 (96.7%) claimed that the CPE brought them a positive impact in their daily practice while the rest 4(3.3%) replied it had no positive impact in their practice. Pharmacists were asked whether they would join if accredited CPE is launched at certificate or diploma level in all areas of pharmacy practice. Accordingly, the majority 326 (92.6%) of them reported that they were interested in the program while 22 (6.3%) said they were not interested and the rest 4 (1.1%) were indifferent.

5.2.3. Pharmacists' Job Satisfaction and Plans of Changing Work-life

5.2.3.1. Pharmacists' Job Satisfaction

Actively practicing pharmacists in general derive slightly higher levels of job satisfaction, with a mean score of 3.0 (SD = 1.11) on the overall job satisfaction item, in scale of 1-5. The item with the highest mean score (3.74 ± 1.06) was satisfaction in relation with colleagues and fellow professionals while remuneration was an item with the lowest mean score (2.55 ± 1.22) (Table 5.6).

Analysis of job satisfaction item mean score by gender indicated that there was no significant difference in satisfaction with the seventeen domains of job satisfaction. However, detail analysis revealed that there was a slight variation for all items except work load and staffing adequacy which were scored equally by both males and females (Table 5.6). Females had a higher score of job satisfaction than males with respect to the relation with colleague and fellow professionals, the way institutional policies are put into practice, being able to do things that don't go against their conscience, competence of their supervisor in making decisions and recognition they get for good work.

Table 5.6. Job Satisfaction Mean Values for All Pharmacists and by Sex, Ethiopia, 2010.

Item	All Pharmacists (N = 393*)		Males (N = 294)*	Females (N = 96)*
	Rank	Mean(SD)	Mean(SD)	Mean(SD)
Physical working conditions	11	3.04(1.18)	3.07(1.18)	2.95(1.19)
Freedom to choose their own method of working	5	3.29(1.22)	3.34(1.24)	3.13(1.15)
Relation with colleague and fellow professionals	1	3.74(1.06)	3.74(1.07)	3.76(1.03)
Recognition they get for good work	8	3.17(1.16)	3.15(1.2)	3.22(1.03)
Amount of responsibility they were given	2	3.57(1.10)	3.62(1.1)	3.39(1.09)
Payment for their work (remuneration)	17	2.55(1.22)	2.57(1.24)	2.48(1.14)
Opportunity to use their abilities	13	2.96(1.22)	2.95(1.24)	2.94(1.14)
Work load and staffing adequacy	10	3.05(1.11)	3.05(1.13)	3.05(1.07)
Amount of variety in their job (Scope of practice)	14	2.84(1.09)	2.85(1.1)	2.80(1.08)
The way their boss handles his/her workers	7	3.18(1.23)	3.19(1.23)	3.12(0.23)
Competence of their supervisors in making decisions	9	3.13(1.17)	3.09(1.19)	3.25(1.13)
Chance to tell people what to do	3	3.36(1.06)	3.36(1.06)	3.31(1.09)
Being able to do things that don‘t go against their conscience	4	3.31(0.94)	3.28(0.94)	3.41(0.93)
Feeling of accomplishment they get from the job	6	3.26(1.09)	3.31(1.1)	3.11(1.06)
The way institution policies were put into practice	15	2.76(1.09)	2.74(1.10)	2.83(1.03)
Chances of advancement on this job	16	2.67(1.15)	2.73(1.16)	2.47(1.11)
Overall satisfaction with their current main job	12	3.00(1.11)	2.99(1.15)	3.02(0.99)

**Some missing values*

A one-way group analysis of variance was conducted to explore the impact of age on levels of job satisfaction. Participants were divided into three groups according to their age (group 1: ≤ 30 years; group 2: 31 years to 40 years; group 3: >40 years). For all items of job satisfaction, analysis showed that there was a statistically significant difference among the three age groups except for the relation with colleague and fellow professionals (Table 5.7). For all items, younger

pharmacists (age of ≤30 years) reported lower satisfaction than the middle age group (31-40 years) pharmacists. On the other hand, older pharmacists (>40 years) reported a higher satisfaction for all items than the other age groups. Amount of responsibility they were given ranked first by the older pharmacists with mean score of 3.94 (SD = 0.97), F (2,374) = 5.7, P = 0.004.

Analysis of job satisfaction by year of professional work experience revealed that more experienced pharmacists (>10 years of professional work experience) scored a consistently higher mean on all the individual work satisfaction items, as well as on overall job satisfaction than with less experienced pharmacists (< 5years and 5-10 years of professional work experience). The differences between more and less experienced pharmacists were significant for all of the items, with the exception of relation with colleague and fellow professionals. Pharmacists with more than 10 years work experience rated freedom to choose their own method as first while less experienced pharmacists (both < 5years and 5-10 years) ranked first for relation with colleague and fellow professionals (Table 5.7).

Work satisfaction of pharmacists was compared by classifying the city/town of practice into four levels. According to the regional and FMOH classification criteria, cities/towns were classified into four levels (Level I, Level II, Level III and Level IV). The classification criteria were: level of development, availability of infrastructures, proximity to Addis Ababa and capital city of the regions, and weather condition of the cities/towns.

Level of city/town appeared to have a significant impact on pharmacists‘ levels of work satisfaction (Table 5.8). Pharmacists working in level IV cities reported lower levels of satisfaction for all items including the overall job satisfaction (mean = 2.37, SD = 0.95) than pharmacists working in level I, II, and III, with the exception of the chance to tell people what to do. On the other hand, pharmacists working in level I city (Addis Ababa) score a higher mean for all items including the overall job satisfaction (mean = 3.15, SD = 1.08) than pharmacists working in other level of cities/towns, with the exception of remuneration, work load and staffing adequacy, chance to tell people what to do.

Table 5.7. Pharmacists' Job Satisfaction Mean Values by Age Group and Years of Professional Work Experience, Ethiopia, 2010.

Item	Pharmacists Age Group			Years of Professional Work Experience		
	≤30 yrs (N=248)** Mean(SD)	31-40 yrs (N=88)** Mean(SD)	>40 yrs (N=51)** Mean(SD)	< 5 years (N=260)** Mean(SD)	5-10 years (N= 58)** Mean(SD)	>10 years (N= 63)** Mean(SD)
Physical working conditions *	2.84 (1.19)	3.32(1.08)	3.61(1.06)	2.86(1.16)	3.09(1.31)	3.68(.90)
Freedom to choose their own method of working *	3.05(1.20)	3.73(1.17)	3.80(1.06)	3.03(1.19)	3.51(1.26)	3.95(.98)
Relation with colleague and fellow professionals	3.72(1.06)	3.81(1.07)	3.82(.95)	3.69(1.08)	3.86(1.10)	3.84(.93)
Recognition they get for good work *	3.03(1.15)	3.29(1.10)	3.71(1.12)	3.03(1.14)	3.20(1.24)	3.75(.97)
Amount of responsibility given *	3.45(1.13)	3.76(.98)	3.94(.97)	3.48(1.11)	3.50(1.13)	3.92(.94)
Remuneration *	2.20(1.05)	2.98(1.29)	3.57(1.06)	2.24(1.07)	2.74(1.34)	3.47(1.02)
Opportunity to use their abilities *	2.73(1.18)	3.26(1.15)	3.55(1.23)	2.74(1.20)	3.17(1.13)	3.44(1.13)
Hours of work load and staffing adequacy *	2.82(1.11)	3.37(1.04)	3.63(.86)	2.83(1.11)	3.26(1.09)	3.61(.84)
Amount of variety in their job (Scope of practice) *	2.72(1.11)	3.00(1.04)	3.17(1.02)	2.69(1.10)	3.04(1.08)	3.24(.90)
The way your boss handles his/her workers *	3.02(1.28)	3.40(1.02)	3.63(1.10)	3.02(1.28)	3.26(1.08)	3.75(.99)
Competence of their supervisors in making decisions *	3.02(1.19)	3.27(1.07)	3.49(1.16)	2.99(1.17)	3.28(1.19)	3.53(1.09)
Chance to tell people what to do *	3.22(1.08)	3.51(.97)	3.78(.96)	3.22(1.09)	3.23(1.06)	3.92(.80)
Being able to do things that don't go against their conscience *	3.17(.93)	3.48(.82)	3.77(.95)	3.18(.92)	3.35(.85)	3.77(.96)
Feeling of accomplishment they get from the job *	3.08(1.12)	3.52(.96)	3.71(.97)	3.09(1.11)	3.30(1.03)	3.76(.82)
The way institutional policies were put in to practice *	2.56(1.09)	3.02(.95)	3.27(1.07)	2.57(1.07	2.93(1.01)	3.34(.97)
Chances of advancement on this job *	2.51(1.15)	2.84(1.14)	3.18(1.02)	2.49(1.14)	2.86(1.15)	3.22(.98)
Satisfaction with their current main job *	2.80(1.07)	3.24(1.06)	3.69(1.03)	2.81(1.09)	3.12(1.13)	3.65(.95)

***Some missing values*

* Differences between pharmacists in different age groups and in different years of professional work experience were significant at P< *0.05 (ANOVA*).

Table 5.8. Work Satisfaction Item Means by Level of Cities/Towns (Std.Dev), Ethiopia, 2010.

Items of job satisfaction	Level of Cities/Towns			
	Level I (N=199)**	Level II (N=56)**	Level III (N=92)**	Level IV (N= 46)**
Physical working conditions	3.06 (1.20)	3.06 (1.10)	3.18 (1.15)	2.72 (1.26)
Freedom to choose their own method of working*	3.38 (1.21)	3.34 (1.24)	3.34 (1.25)	2.74 (1.08)
Relation with colleague and fellow professionals*	3.88 (1.01)	3.62 (1.11)	3.69 (1.07)	3.41 (1.13)
Recognition they get for good work*	3.33 (1.15)	3.18 (1.18)	3.07 (1.15)	2.72 (1.09)
Amount of responsibility they were given	3.66 (1.12)	3.48 (1.15)	3.62 (1.01)	3.22 (1.05)
Payment for their work (remuneration)*	2.62 (1.24)	2.69 (1.19)	2.55 (1.24)	2.09 (0.99)
Opportunity to use their abilities*	3.17 (1.19)	2.72 (1.18)	2.85 (1.25)	2.53 (1.14)
Work load and staffing adequacy	3.10 (1.14)	2.95 (1.09)	3.13 (1.06)	2.80 (1.11)
Amount of variety in their job(Scope of practice)	2.94 (1.06)	2.61 (1.16)	2.90 (1.11)	2.59 (1.07)
The way their boss handles his/her workers*	3.36 (1.20)	3.33 (1.30)	3.05 (1.28)	2.50 (0.91)
Competence of supervisors in making decisions*	3.29 (1.14)	3.18 (1.11)	3.03 (1.24)	2.62 (1.09)
Chance to tell people what to do	3.46 (1.04)	3.48 (.99)	3.13 (1.15)	3.22 (1.01)
Being able to do things that don‘t go against their conscience	3.35 (.95)	3.40 (.98)	3.27 (.87)	3.12 (.97)
Feeling of accomplishment they get from the job*	3.39 (1.08)	3.09 (1.16)	3.30 (1.04)	2.82 (.98)
The way institutional policies were put in to practice*	2.95 (1.09)	2.71 (1.08)	2.74 (1.10)	2.09 (.73)
Chances of advancement on this job*	2.89 (1.12)	2.45 (1.25)	2.58 (1.13)	2.24 (1.05)
Overall satisfaction with their current main job*	3.15 (1.08)	2.96 (1.13)	3.03 (1.17)	2.37 (.95)

***some missing values*

** Significant at P < 0.05 (ANOVA)*

The differences in job satisfaction among pharmacists working in different level of cities/towns were significant for all of the items with the exception of physical working conditions, amount of responsibility given, scope of practice, work load and staffing adequacy, chance to tell people what to do, and being able to do things that don‘t go against their conscience.

Work satisfaction was also compared for pharmacists working in different area of practice. The results indicated that pharmacists working in hospital pharmacy had significantly the lowest overall satisfaction with their main job, with a mean score of 2.52 (SD = 1.01) while pharmacists working in the other*** areas of practice reported the highest overall satisfaction with their main job, with a mean score of 3.78 (SD = 0.73). With the exception of remuneration, physical working condition and work load and staffing adequacy, pharmacists working in hospital pharmacy reported the lowest satisfaction score for all items of job satisfaction than the other pharmacists. For all the seventeen items of job satisfaction, the analysis shows that there was a statistically significant difference for the pharmacists at different areas of practice except for relation with colleague and fellow professionals (Table 5.9).

Analysis of job satisfaction item mean score by educational status indicated that there was no significant difference in satisfaction with the seventeen domains of job satisfaction.

If they had to make the choice all over again, pharmacists were asked if they would still choose pharmacy. The response was rated on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). Overall, the actively practicing pharmacists reported a slightly higher mean score for the item, 3.37±1.43.

Table 5.9: Work Satisfaction Item Means by Area of Practice (Std.Dev), Ethiopia, 2010.

Item	Community (N =75)**	Hospital (N=143)**	Industry (N=20)**	Academic (N=34)**	Sales and Marketing (N=64)**	Regulatory and Office (N=39)**	Others *** (N=18)**
Physical working conditions *	3.48(1.01)	2.57(1.16)	2.45(1.00)	3.30(1.21)	3.66(1.02)	2.86(1.10)	3.47 (1.01)
Freedom to choose their own method of working *	3.68(1.20)	2.76(1.14)	3.30(1.13)	3.67(1.34)	3.78(1.07)	3.16 (1.17)	3.59 (1.00)
Relation with colleague and fellow professionals *	3.75 (1.02)	3.48(1.13)	4.10(0.72)	3.76 (.99)	3.98(1.03)	3.97 (1.09)	4.06 (.87)
Recognition they get for good work *	3.57 (1.10)	2.81(1.15)	3.25(1.12)	2.88(1.12)	3.65 (.99)	3.05 (1.15)	3.56 (1.04)
Amount of responsibility they were given *	3.91(.94)	3.20 1.15)	3.80 (.95)	3.71(1.06)	3.82(1.09)	3.66(.99)	3.67 (.91)
Payment for their work (remuneration) *	3.15 (1.13)	2.10 (.99)	2.35(1.14)	1.97 (.98)	3.36(1.23)	1.90 (1.02)	3.44 (.98)
Opportunity to use their abilities *	3.21 (1.25)	2.53(1.15)	2.95(1.10)	2.73(1.23)	3.48(1.08)	3.08 (1.24)	3.67 (.77)
Work load and staffing adequacy *	3.43 (1.01)	2.68(1.11)	2.50(1.00)	3.09(1.11)	3.52 (.95)	3.05 (1.05)	3.39 (1.15)
Amount of variety in their job(Scope of practice) *	2.90 (1.05)	2.50(1.10)	2.80(1.01)	2.91(1.16)	3.22 (.89)	3.16 (1.03)	3.29 (1.21)
The way their boss handles his/her workers *	3.66 (1.09)	2.74(1.21)	3.15(1.18)	3.29(1.22)	3.75 (.99)	2.97 (1.37)	3.39 (1.04)
Competence of their supervisors in making decisions*	3.41 (1.26)	2.74(1.11)	3.15 (.99)	3.24(1.25)	3.71 (.90)	3.00 (1.21)	3.41 (1.01)
Chance to tell people what to do	3.74 (.95)	3.05(1.10)	3.50 (.89)	3.21 (.89)	3.70 (.97)	3.10 (1.17)	3.61 (.98)
Being able to do things that don‘t go against their conscience *	3.58(.91)	3.00 (.98)	3.50 (.76)	3.28 (.89)	3.55 (.81)	3.32(.93)	3.56 (.71)
Feeling of accomplishment they get from the job *	3.48(.97)	2.90(1.13)	3.50(1.15)	3.35 (.95)	3.78 (.85)	3.05 (1.11)	3.41 (1.12)
The way institution policies were put in to practice *	3.06 (1.03)	2.26 (.90)	3.05(1.13)	2.48 (.98)	3.43(1.01)	2.74 (1.16)	3.56 (.81)
Chances of advancement on this job *	2.65 (1.17)	2.16(1.01)	2.63(1.07)	2.94(1.09)	3.41(1.03)	2.92 (1.09)	3.17 (1.15)
Overall satisfaction with their current main job *	3.25 (1.10)	2.52(1.01)	3.15(1.09)	3.09(1.14)	3.54(1.03)	2.90 (1.05)	3.78 (.73)

***some missing values*

**** Consultancy, administrative office other than government*

** Significant at P < 0.05 (ANOVA)*

5.2.3.2. Intentions to Change Work-life

More than one-third (37.7%) of the respondents reported that it was highly likely for them to leave the current area of practice within the next two years. More than one in ten of the actively employed pharmacists also reported they would reduce hours of work or leave the profession altogether in the next two years (Table 5.10).

Table 5.10. Pharmacists' Likelihood of Work-life Change within the Next Two Years (row %), N = 393*, Ethiopia, 2010.

Item	Not likely	Less likely	Likely	High likely	Very high likely
Leave their current area of practice	16.7%	22.5%	23.1%	16.7%	21.0%
Reduce work hours	43.7%	29.8%	15.3%	5.7%	5.5%
Leave the profession altogether	62.6%	14.8%	10.4%	7.7%	4.4%

**some missing values*

A comparison of pharmacists' likelihood of work-life change by age group (Table 5.11), indicates that pharmacists in the age group of over 40 years were significantly most likely to reduce work hours in the next two years ($X^2 = 16.687$, P = 0.034). Pharmacists aged 30 years and below were significantly more likely to change area of practice in the next two years ($X^2 = 32.141$, $p < 0.01$). Pharmacists aged less than 30 years and below were also more likely to report a strong likelihood of leaving the profession altogether in the next two years.

Pharmacists' years of professional work experience was analyzed to evaluate if it had an impact on the decision of work-life plan within the next two years. The result indicated that as years of professional work experience increase, the likelihood of leaving the current area of practice increases while the likelihood of leaving the profession decreases. Pharmacists with lesser years of work experience (< 5 years) were significantly more likely to report a strong likelihood of leaving the current area of practice within the next two years than pharmacists with 5-10 years of experience. Pharmacists with 5-10 years of work experience in turn were significantly more likely to report a strong likelihood of leaving the current sector of practice than pharmacists with

more than 10 years of experience. Pharmacists with lesser years of experience (< 5 years) were also more likely to report a strong likelihood of leaving the profession while pharmacists with longer years of work experience (> 10 years) reported strong likelihood of reducing work hours within the next two years (Table 5.11).

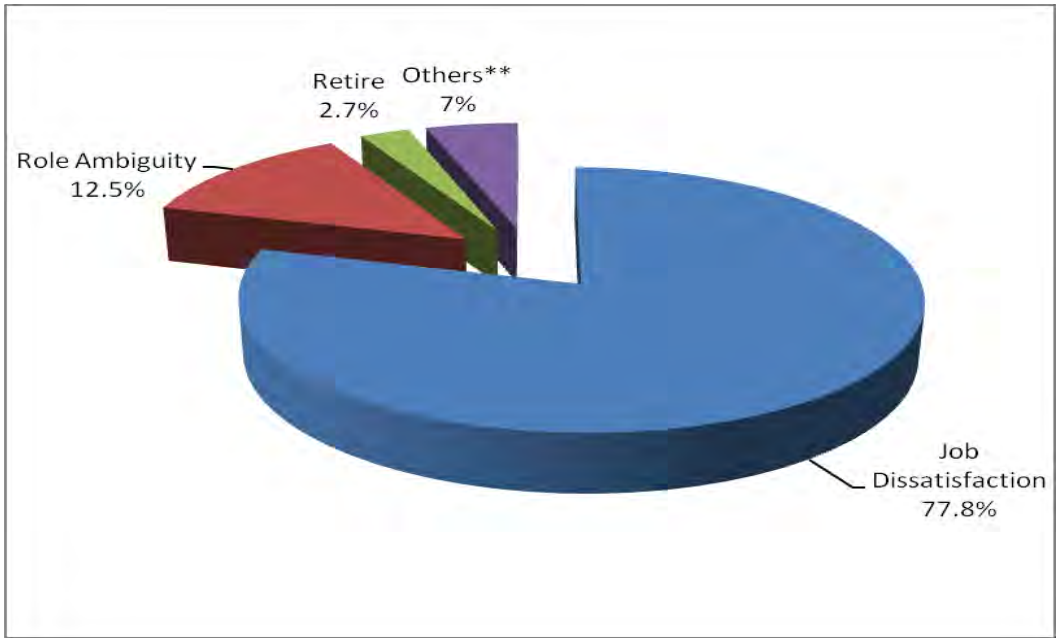
Table 5.11: Pharmacists' Likelihood of Work-life Change within the Next Two Years by Age Group, Years of Work Experience and Area of Practice, Ethiopia, 2010.

Item Category	High likelihood of leaving area of practice (%)	High likelihood of reducing work hours (%)	High likelihood of leaving profession (%)
Age group			
≤30 years (N = 248)*	45.9	11.2	13.3
31-40 years (N =88)*	24	8.6	12.6
>40 years(N =51)*	18.4	20	6.3
Years of work experience			
< 5 years (N =260)*	47.1	12.4	14.9
5 - 10 years (N =58)*	23.1	7.9	11.4
>10 years(N =63)*	14.7	16.2	5.1
Area of pharmacy practice			
Community(N =75)*	24.3	17.4	14.7
Hospital(N =143) *	52.8	13.6	16.8
Industry(N =20) *	35	15	10
Academic and research(N =34) *	35	3.1	6.3
Sales and marketing(N =64) *	27.3	6.7	5
Regulatory and government office (N =39) *	25	13.2	7.9
Others**(N =18) *	43.6	0	11.1

**some missing values*

Analysis of plans to change work-life by area of practice (Table 5.11) revealed that pharmacists working in the hospital pharmacy were significantly highly likely to leave the area of practice within the next two years (X^2 = 58.256, P < 0.01) and they were more likely to report a strong likelihood of leaving the profession within the next two years. Pharmacists working in community pharmacy were significantly more likely wanted to reduce work hours within the next two years (X^2 = 44.093, P = 0.007).

Comparison of plan to change work-life within the next two years for different level of cities/towns also indicated that pharmacists working in level IV towns were significantly highly likely to leave the current area of practice (X^2 =23.619, P = 0,023) than pharmacists working in the other categories. The proportion of pharmacists who respond high likely to reduce work hours and leave the profession were higher in level IV towns than pharmacists working in the other levels. Chi-square tests at 5% level of significance for pharmacists plan to change work-life within the next two years indicates that there was no significant difference between pharmacists according to gender, and level of education.



** *Others include: Work home conflict, No bright future for pharmacy in Ethiopia, loss of professional ethics (the existing unethical practice), and policy makers undervalue the need for pharmacists in Ethiopia.*

Figure 5.5. Pharmacists' Main Reasons to Change Work-life, Ethiopia, 2010.

Pharmacists who reported that they would leave the profession were asked about their main reasons for such decision. Accordingly, majority of the pharmacists 56 (77.8%) mentioned job dissatisfaction and more than one-in-ten 9 (12.5%) pharmacists claimed role ambiguity as main driving force for leaving the profession (Figure 5.5).

The high number of professionals leaving the current area of practice and leaving the profession altogether could be a danger for the profession and the health care system in general. Hence, majority of the pharmacist 184 (46.8) recommended the opportunities for CPE should be improved as a means to motivate pharmacists to remain in their current area of practice and not to leave the profession (Table 5.12).

Table 5.12. Recommendation Forwarded to Retain Pharmacists within their Profession and, Ethiopia, 2010.

Item	N (%)*
Increase in salary	171 (43.5)
More variety in job	138 (35.1)
Better working condition	99 (25.2)
Better career development opportunities	106 (27)
Recognition of achievements and contribution	64 (16.3)
Improved CPE opportunities	184 (46.8)
Closer working relationships with other health care professionals	84 (21.4)
Fair and equal treatment among professionals	83 (21.1)
Others**	99 (25.2)

**Percentages don¨t add up to hundred because one person may give more than one recommendations but not more than three*

***Changing the curriculum to clinical pharmacy, improve the existing poor drug supply management system, teaching the public and other health care professionals about the role of pharmacist*

5.3. Findings of Key Informants' Interviews

An in-depth interview was done with key informants from five regions (Oromia, Amhara, Tigray, Benshangul Gumuz, Afar) and one city administration (Addis Ababa). In addition, two participants were selected from FMOH for the in-depth interview. The participants were all male with a mean age of 40.7 years. All participants had undergone various college/university education. Two of the respondents had Masters of public health, two health officers, one nurse, one BA in management, one physician and one druggist (who was delegated by the head of regional health bureau). The participants of the interview had worked in their current position for a period ranging from 1 to 10 years and the average number of years at current job for the participant was 6.7 (SD = 7.6).

Availability and Importance of Job Description

All the study participants indicated that a well written job description can serve as a management tool and greatly simplify an organization's human resource management. It clarifies work functions and reporting relationships, helping employees understand their jobs and act accordingly. In addition, performance evaluations, which help the institution in taking appropriate interventions, may be based on job descriptions. However, job descriptions were not used by all regions to evaluate the performance of their pharmaceutical personnel. All key informants agreed that in the absence of job description, it is difficult to address accountability and there might be work overlap. This also contributes for the professionals not to discharge what is expected from them and at times professional conflict of interest. This was explained by one of the respondents:

> *"Job description helps for professionals to act according to the specified activities. If this tool is not available, in most of the cases, it causes role ambiguity and professionals always perform below what is expected from them."*

Majority of the respondents ensured that the availability of written job description for pharmacists practicing in their region while a respondent from one region was not quite sure about its availability. One of the respondents mentioned that they had no written job description

but they planned to prepare it in the near future. All key informants mentioned that the job description in the regions was also soundly recognized in the business process re-engineering (BPR) and tasks of pharmacist were well described as pinpoint responsibilities. However, the job description available in most of the regions was not easily accessible to pharmacists and mostly it was found in the hands of managers. To make the implementation of job description simpler and maximally utilize pharmacists, majority of the participants recommended if FMOH prepared a standard job description for pharmacists working in the country. This was evident from one of the participants:

> *"……a clearly defined job description should be prepared by the FMOH that help the regions implement better pharmaceutical services and pharmacists can also use it as a bible since it is from federal office."*

On the other hand, participants from the FMOH mentioned for the presence of written job description for pharmacists which was prepared in 1990s. But, it was neither revised on time nor distributed to the regions. The respondents stated that the job description was given to regions if and only if regions asked for it. The participants explained that, since the actual activities of pharmacy were not performed in the ministry and the federal office was working with policy issues, preparation of job description for pharmacists (their workers) was totally the mandate of regions and health institutions.

The majority of participants believed that pharmacists were doing in accordance with the specified job description but one participant claimed that pharmacists were not doing what the region was expecting from them. All the key informants agreed that RHBs didn't show any initiative to enforce pharmacist to perform in harmony with the available job description. The reason mentioned by all participants was due to the fact that institutions were established by a proclamation that they had the full authority to recruit, follow and enforce their employees to perform in the interest of the institution.

Pharmaceutical Sector in Ethiopia

All of the key informants mentioned that the quality of health care service was becoming a concern for Ethiopia. Hence, engaging multidisciplinary expertise and organizing the service in a team manner was mentioned by all participants as a means to improve the existing poor quality pharmaceutical services. All of the key informants agreed for the advocacy of team work as most employees want to feel that they own their jobs and are making meaningful contributions to the effectiveness of their organizations, develop more creative solutions to difficult problems and provide possibilities for empowerment that are not available to individual employees.

All the respondents mentioned that pharmacists as a member of the health care team were recognized for their importance as a health care provider in the country. They added, the new health reform recognized pharmacists as a member of all case teams and their role was explicitly defined. All of the key informants believed that pharmacists have better knowledge and experience of drugs than other health care professionals and hence they recommended pharmacists to be part of the treating team and be involved in day to day patient management activities, in advising doctors and other health care professionals. On the other hand, all key informants claimed that pharmacists were physically and mentally detached from the health care team. All respondents agreed that pharmacists were unable to change the knowledge they acquire in school into real practice. One respondent from the FMOH strengthen this:

> *"……..Physicians had no experience of getting drug information from pharmacist and still now they don't appreciate the role of pharmacist. This is not because they don"t need the service but because they haven't experienced it before. So, how could you expect them to ask for something which they don"t know? Hence, it is the responsibility of the pharmacists to show they are important and I am sure the government, public and other health care professionals will welcome their contribution."*

Key informants were asked for their opinion on the difference in the level of training and actual practice among pharmacists and druggists/pharmacy technicians. All key informants asserted that pharmacist long stay in training school indicates that they acquire more knowledge and skill than druggists and pharmacy technicians. Thus, it helps them to give evidence based

pharmaceutical services than any other professionals including druggists and pharmacy technicians. But, in the actual practice all key informants agreed that all pharmacy personnel (pharmacists, druggists, pharmacy technicians and pharmacy aids) were doing same job which is the traditional dispensing practice. Majority of the respondents mentioned that pharmacy professionals in Ethiopia do have difference in level of education but not in practice could be an indication that the profession is still not well utilized. This was exemplified by a statement made by one key informant from the FMOH:

> *"……Let alone the public it is even difficult for other health care professionals to clearly define what special services they can get from pharmacy but not from drug stores. I think the confusions are because we see no difference in the service they provide. So, pharmacists should strive to show us that they are capable of performing activities different from the routine practice of dispensing which they are doing it now."*

A key informant from one region supported the idea:

> *"…….while they are capable of delivering more services, they are doing simple dispensing and even some professionals give them a „Nickname".As a result, people are saying pharmacy is saturated. But if the professionals widen their scope of practice and motivated to cope with the new dimension of pharmacy practice, at times the reverse can be true where there might be shortage of pharmacists."*

Absence of clearly defined job description, lack of better working condition, thinking of pharmacists as they are not member of the health care team, lesser motivation of pharmacists to share their knowledge, shortage of pharmacists in general and shortage of experienced pharmacists in particular were mentioned by some as reasons for pharmacists to remain in the traditional dispensing practice.

Respondents from the FMOH cited that the distribution of pharmacists was uneven with respect to location (urban/rural areas or less-developed/more-developed regions). They added, pharmacists showed a preference to work in urban areas and most of them were concentrated in Addis Ababa. A key informant from the FMOH stated that rural and remote areas of Ethiopia

were particularly underserved by pharmacists. To solve the problem, the government increased the number of pharmacy student enrolments and pharmacy schools occurred alongside an expansion in the number and roles of pharmacy technicians.

Majority of the key informants reported that all health institutions, which must have pharmacist on duty according to the FMOH, in their regions have pharmacists but the number was not sufficient. Shortage of budget was mentioned by all respondents as the main limitation not to recruit and maintain more number of pharmacists than they had. All of the respondents (except one) claimed for the need of pharmacists in health centers but one of the respondents claimed that pharmacists were required only in hospitals. The key informant testified this:

> *".....in the health centers we don"t need pharmacists but we need them in general and specialized hospitals where vital drugs are available. "*

Respondents from the historically disadvantaged regions mentioned that the high attrition rate due to unfavorable weather condition is additional problem for the shortage of pharmacists in their region. High attrition rate of pharmacists also made these regions to remain with less experienced pharmacists having a maximum of 1-2 years. Hence, as a strategy, one of the regions was planning to help druggists upgrade their knowledge and make the service better. The previous policy which was designed to accommodate only druggists and pharmacy technicians was also reported by two respondents as a main barrier not to recruit more number of pharmacists. One of the participants strongly expressed that:

> *".....pharmacists are not available in all health centers and one of our hospitals has no pharmacist. So, shortage of pharmacists forced us to run all pharmaceutical services by druggists and pharmacy technicians."*

All key informants from the FMOH mentioned that introduction of compulsory service, where all health care professionals were expected to serve the public for some specified number of years, was used as a means to retain professionals. The FMOH had the responsibility to assign the required number of pharmacists and did it for about five years. Nevertheless, all participants of the regions except one mentioned that there were times where they return pharmacists which

were assigned to them. This idea was supported by participants from the FMOH. Surprisingly, all regions who mentioned shortage of pharmacists as a main impediment to provide quality pharmaceutical services reported for returning pharmacists assigned to them by the FMOH. Main reasons not to recruit more pharmacists shared by all respondents were shortage of budget, the existing system which favor for employing more number of druggists/pharmacy technician and policy makers thinking that pharmacist and druggist have no difference in the service they provide.

Majority of the participants stated that the highly decentralized Ethiopian government system gives the mandate of recruiting professionals to weredas but mangers working in weredas were not familiarized with the role of pharmacists. In addition, key informants from the FMOH mentioned that the observations on the actual practice make any policy makers to conclude pharmacists have no different role from druggists or pharmacy technicians. Two of the respondent from the regions cited that, during the time where there was shortage of pharmacists the system was designed in a way to accommodate only druggists. Respondents reported that they tried to negotiate with weredas to change the system in a manner that accommodates more pharmacists. However, the managers always complain about shortage of budget. The following expression of one participant from one region demonstrates this idea:

> *"……though we have shortage of pharmacists we return pharmacists because the system in the region was designed to accommodate more druggists. Weredas were also unwilling to change the previously designed system complaining that while there is no difference in the service they provide, there is a big variation in salary. So, why don"twe recruit two or more druggists instead of one pharmacist? So we returned pharmacists not because of saturation of pharmacists but saturation in terms of budget."*

To enhance the contribution of pharmacist in the country's health care system, the curriculum of pharmacy was changed from a focus on basic pharmaceutical sciences to more of practical and patient centered practice. The overarching goal was to raise the profile of the pharmacist from a quiet member of the healthcare team to a more visible and vital component of patient care. All respondents welcomed the change in curriculum and they believe that it will help improve the

poor pharmaceutical service in the country and will help to enhance the satisfaction of patients and professionals. One participant stated:

> *"….. clients are very dissatisfied by the service they get from hospital pharmacy. Even pharmacists, I didn"t expect them to be satisfied with their job because they don"t have the chance to see the outcome of the medicine they dispense. But I hope this new curriculum might solve the gaps within pharmacy and I think this is rewarding for the profession."*

However, all respondents agreed that the program should be accompanied by huge promotional activities. All key informants mentioned that all stakeholders especially the regions, Weredas, Zones and health institutions should be well informed about the responsibilities of these new graduates. All of the participants stated that schools should not concentrate only in graduating and sending them to health facilities but a follow up mechanism should also be in place. One key informant strongly stated:

> *".....to make the program fruitful, schools should communicate with federal and regional health bureaus. Otherwise, if they simply focus on graduating, I don't expect a visible change."*

Widening the job scope of pharmacy, pharmacists thinking and motivation to be member of health care team, better working condition, recognition for good work (rewarding based on performance), increasing incentive packages, improving awareness of physicians and the general public about pharmacy, increasing number of pharmacy staff were among the recommendations forwarded to improve the pharmaceutical service in the country.

6. Discussion

The first ever census of pharmacist‘s practicing in Ethiopia was undertaken in all regions to provide robust and comprehensive data about all actively practicing pharmacists. The study discovered essential information related to pharmacy workforce including the actual number of practicing pharmacists and their distribution among regions/city administrations. The required number of pharmacists for the next fifteen years was also forecasted based on the actual number of practicing pharmacists, population size and forecasted GDP per capita of the country. In addition, the study assessed pharmacists‘ job satisfaction and plan of changing work-life within the next two years. It also determined the professionals‘ loss rate and policy makers‘ view of pharmacy practice in the country. In the study, both qualitative and quantitative methods were employed by complementing each other.

The present study revealed that Ethiopia with the second largest population in Africa (Zekaria, 2008), had 1,898 actively practicing pharmacists (2.38 pharmacists per 100,000 population). This is by far smaller than the African countries average (8.0 pharmacists per 100,000 population) and in America, this ratio reaches 54.0 (Dayrit et al, 2006). Based on the WHO recommended ratio and African countries average density of pharmacists, Ethiopia had a shortage of 38,020 and 4,489 pharmacists respectively. Considering the economic development of the country, it might be impossible to achieve the WHO recommended pharmacist density but the African countries pharmacists‘ density is achievable even by developing countries. In Ethiopia, three regions/city administration achieve much higher than this ration, which indicates the health care system is capable of absorbing more pharmacists than what they had. However, in Ethiopia there are issues of pharmacy saturation. This idea of saturation in Ethiopia could be due to improper planning and use of pharmacists. The key informants also revealed that the regions/city administration suffers from shortage of pharmacists but shortage of budget to recruit adequate number of pharmacists was stated as a main obstacle. This shortage of pharmacists could undermine equitable access and availability of medicines to the communities in the country and therefore deter the reduction of morbidity and mortality (Dayrit et al, 2006).

The present study discovered that pharmacists were found unevenly distributed between regions, private and public sectors. For instance, in Afar alone, a remote and underserved region, the

density of pharmacist per 100,000 population was 0.66 as compared to Addis Ababa which was 29.88. Nationally the density of pharmacist per 100,000 population was 2.38. Despite about 97.3% of Ethiopia population is living outside the capital and 90% of the public hospitals are located in the regional states (Berhan, 2008), approximately half (45.9%) of the pharmacists were working in Addis Ababa. This might indicate that the majority of the health institutions in the other regions were performing all pharmaceutical services by other pharmacy staffs, which includes druggists, pharmacy technician and pharmacy aids. However, this study had a limitation as it didn‘t try to enumerate the actual number of practicing pharmacy personnel other than pharmacists.

The current developments in pharmacy practice, its diversification as well as its aspiration for increased patient orientation and economic development of countries have driven an increase in pharmacy workforce demand (Chan and Wuliji, 2006; FIP, 2009). For Ethiopia, the sustained economic development and introduction of new pharmacy curriculum is expected to boost the demand for pharmacists. As obtained from the key informants‘ interview, it was identified that the introduction of the new curriculum could probably widen the scope of practice and improves the quality of pharmaceutical services which then requires more number of pharmacists than the usual.

Research results showed that the required pharmacists to population ratio increases with increasing GDP per capita of one country (Chan and Wuliji, 2006; FIP, 2009; Health Care Intelligence, 2003; Human Resources Development Canada, 2001). The continuous two digit development of the economy of the country expectedly results in health service expansion and the demand for quality of care, which in turn requires more number of pharmacists. Based on the lower and middle income countries scenario, the present study showed that the demand for pharmacists is forecasted to increase from 5,249 (6.49 pharmacists per 100,000 population) in 2010/11 fiscal year to 30,003 pharmacists (25.90 pharmacists per 100,000 population) in 2024/25 fiscal year. While using the lower, middle and higher income countries scenario, the forecasted demand of pharmacists for the 2024/25 fiscal year is 28,278. Comparable growth in pharmacists per capita was noted in Canada between 1988 and 1997. Data from the Canadian Institute for Health Information showed that the number of pharmacists per 100,000 population rose from 64 to 76 in the course of a decade and the increase in density of pharmacists was high

in Prince Edward Island which rose from 56.1 to 82.7 (Human Resources Development Canada, 2001). Similarly, in Australia the demand for pharmacists was projected to increase between the years 2000 to 2010 from 13,000 to 17,200; thus leading to a shortfall of about 3,000 pharmacists by 2010 (Health Care Intelligence, 2003).

One of the most damaging effects of severely weakened and under-resourced health systems is the difficulty they face in recruiting and retaining health professionals both in the country and in the health sector (Lehmann et al., 2008). The present study investigated that pharmacists' average annual loss rate for fourteen years (1993-2006) was 6.5%. Though pharmacists' annual loss rate is almost half less than that of Ethiopian medical doctors' with 14% average annual attrition rate of 5 years (1988-1992) (Berhan, 2008), with serious pharmacy workforce shortages already highlighted, the loss of professionals increase the demand on pharmacists and if continued it will severely weaken the pharmaceutical services. In order for policies to be effective in maximizing the gains and minimizing the risks from loss, root causes to attrition must be identified and interventions implemented.

Although this study didn't anticipate to find reasons for professionals' loss, previous study viewed in-country job dissatisfaction and attractive enumeration overseas as the main reason for the high attrition rate in many low-income countries (Berhan, 2008; Hawthrone and Anderson, 2009; Lehmann et al., 2008). Another key issue is related to the pharmacy curricula. While the curricula in developing countries produced highly competent individuals, it did not necessarily prepare them for the realities of a career in their own country. Thus, disillusionment and frustration may result in increased emigration to more-developed countries (Hawthrone and Anderson, 2009; Mathauer and Imhoff, 2006).

The present finding indicated that, majority of the practicing pharmacists (77.7%) were males and majority of the females were working in hospital pharmacy. Congruent to this finding Walton and Cooksey (2001) found that female pharmacists are 70% more likely to work in the hospital industry than male counterparts. The finding of this study with regard to gender composition is also comparable to study result documented by Tanzania Ministry of Health and Social Welfare, where 72.6% of the pharmacists were males (Tanzania Ministry of Health and Social Welfare, 2010). However, the study result is not comparable to other studies conducted in

UK and Czech Republic where females dominated the pharmacy work force (FIP, 2009; Hassell et al., 2006; Willis et al., 2009).

A 2009 report of FIP indicated that African region has less than 5% of its workforce employed in the pharmaceutical industry, in contrast to the South East Asian region where the pharmaceutical industry employs up to 55% of the pharmacist workforce (FIP, 2009). The present investigation also showed that the least proportions (3.4%) of pharmacists were working in industry which is comparable to other African countries. This could be an indication that the pharmaceutical industry sector in Ethiopia is still not well developed. Hence, the sector needs more attention as it will offer an incremental boost to the local economy.

Globally hospital pharmacists comprise up to 15.5% of the pharmacy workforce, and hospitals are often the second largest sector employing pharmacists next to community pharmacy sector (Chan and Wuliji, 2006). But, the present study demonstrate that in Ethiopia hospital pharmacy ranked first in terms of employing large number of pharmacists followed by community pharmacy. Though the policy of compulsory service years now excluded for pharmacists, the key informants mentioned that the introduction of the policy in the previous time contributed for the presence of high proportion of pharmacists in hospital pharmacy.

The results of the job satisfaction scale indicated that pharmacists in Ethiopia were generally less satisfied with their job. Although mean scores were positive, the level of job satisfaction was not very high and scores usually averaged near the neutral point. As expected for a developing country, pharmacists had lower extent of satisfaction than observed by Seston et al (2009) who described generally positive work-related attitudes among British Pharmacists. The finding also revealed that pharmacists working in urban areas were more satisfied with their job than those working in relatively rural areas. The finding also showed that older pharmacists were more satisfied with their job than the younger pharmacists which mirrors the previous studies done in UK **(**Hassell et al., 2006; Seston et al., 2009).

The present study results showed that levels of job satisfaction might not be significantly related to certain demographic variables, such as sex. This finding is similar to Maio et al‘s survey (Maio et al., 2004) but differs from other previous survey in which female pharmacists reported

significantly higher levels of job satisfaction than their male counterparts (Hassell et al., 2007; McHugh, 1999). Hence, additional research is needed to investigate sex-related job satisfaction within the pharmacy profession and address these discordant results.

Similar to findings to research done in UK, the present study revealed that pharmacists were least satisfied by the amount of payment they get for their work (Hassell et al., 2006; Seston et al., 2009). Luboga et al (2010) found that salary was a major cause of dissatisfaction among health workers and it is the most frequently cited reason for considering leaving one‘s job and country. The present study is also in consistent to research outside health care workers which has found job satisfaction to be highly correlated with remuneration (Rice et al., 1990). Others researchers also described salary as a __hygiene‘‘ factor; that is, when salary is not at an adequate level, it is a de-motivator, but adequate salary alone is not a motivator (Luboga et al., 2010). In USA, a strategy of increasing pharmacists‘ salaries was adopted to address shortages. This combined with attractive job opportunities led to a subsequent increase in student numbers and the number of graduates has increased (Kenreigh and Wagner, 2006).

The present study results reinforced earlier findings that job satisfaction varied according to the work setting. As suggested, differences in workplace activities might help to explain reported variations in job satisfaction within practice settings (Cox and Fitzpatrick, 1999; Kahaleh and Gaither, 2007; Maio et al, 2004; McHugh, 1999). The results of this study showed that pharmacists working in hospital pharmacy were significantly less satisfied with their jobs than other pharmacists. This was not expected because previous studies (Hassell et al., 2006; Seston et al., 2009) observed different results where community pharmacists were generally less satisfied than their counterparts working in the hospital or primary care sectors. One possible explanation to the present investigation could be the existing role of pharmacists in the hospital setting which is still more of distributive functions and not fully involved in the new dimension of pharmacy practice called pharmaceutical care. Hence, pharmacists in hospital pharmacies might perceive that they are using their skills to a lesser extent than their peers employed in the other settings.

As hospitals offer the pharmacist close cooperation with other health professionals, the integration of pharmaceutical services with other patient services, and a direct and observable

influence on patient care, diversity in job responsibilities is a key to improving job satisfaction (Sansgiry and Ngo, 2001). Congruent with previously published research, hospital pharmacists‘ levels of satisfaction was found to be influenced by opportunity to use their abilities in their work setting. In a study of key determinants of hospital pharmacy staff's job satisfaction, Kahaleh and Gaither (2007) identified that ability to utilize skill was the most important factor in their perception of the ideal job. Researchers in Arizona also found that pharmacists practicing in institutional or hospital settings were involved in more non-distributive functions perceived that they were using their skills to a greater extent and are more satisfied than community practitioners (Cox and Fitzpartick, 1999). The fact that pharmacists working in hospital pharmacy were more likely than pharmacists in the other category to consider leaving the current area of practice and the profession may also suggest dissatisfaction on their career.

Generally in an effort to enhance coverage and quality of pharmaceutical services, hospital pharmacy staff needs to feel certain about their future, so managers should strive to secure the pharmacist's role in the provision of health care. It is therefore important if pharmacy managers focus on altering the job to provide greater use of skills and abilities and to provide increased challenge in the work. Many studies indicated that alignment of career expectations, aptitude and the pharmacy course content with the actual realities of the practice was imperative to ensure career satisfaction (Hawthrone and Anderson, 2009).

Regarding intentions of pharmacists‘ to quit, the result suggests that there is a relationship between age, year of professional experience and intention to quit. In this respect younger pharmacists and pharmacists in the first five years of their career were more likely to have considered leaving the sector and the profession than in the other category. Similarly, younger and less experienced pharmacists reported lower satisfaction for all individual satisfaction items including the overall satisfaction than pharmacists in the other category. This is consistent to the previous studies on pharmacists where it was found out that younger pharmacists were more likely to leave the profession (Hassell, 2006; Willis et al., 2008). A recent Uganda study with health workers found that only 20% of health workers planned to stay in their jobs at least three years and another 26% reported that they were eager to leave their jobs soon. Of those ready to leave soon, 11% would leave Uganda (Uganda Ministry of Health, 2007). It is possible,

therefore, that some of the young pharmacists in this study who reported a high likelihood of leaving the profession were thinking of going overseas.

The study result also showed that pharmacists working in level IV cities were significantly more likely to report high likelihood of leaving the area of practice, the profession and reduce work hours. The key informants also cited the difficulty of retaining pharmacists for longer years as one of the main obstacle not to improve the existing poor pharmaceutical services. Job dissatisfaction could be one of the factors for pharmacists‘ high attrition rate from the rural and remote areas especially in the emerging regions. This was recognized in the present study that pharmacists working in rural and remote areas (level IV cities) were least satisfied with all individual satisfaction items and overall satisfaction than pharmacists working in relatively urban areas. This concurs with study done for pharmacists working in Wales and Tanzania where level of professional satisfaction was stated as the main factor affecting recruitment and retention of pharmacists in rural areas (Harding et al., 2006; Ministry of Health and Social Welfare, 2010). Lacks of access to CPE, high workload, lack of infrastructure, lack of motivating working environments, and the accompanying reduction in quality of life in the rural areas were reasons for some rural pharmacists to consider leaving their practice (Harding et al., 2006; Lehmann et al., 2008; Ministry of Health and Social Welfare, 2010). Hence, encouraging voluntary relocation of professionals with significant incentives might be a better approach to decrease the attrition rate. For instance, it has been suggested that further qualifications be credited to the recruit after a certain retention period (Harding et al., 2006).

Though intention to leave the profession may not necessarily translate into action, the fact that 12 in 100 pharmacists were considering leaving the profession could be regarded as a cause for concern. Majority of the pharmacists claimed job dissatisfaction (77.8%) and role ambiguity (12.5%) as the main reasons that prompt them to leave the profession. A study by Hassel et al (2006) also reported that 1 in 10 pharmacists were considering leaving the profession and several factors were found to affect pharmacists‘ intentions to quit the profession. A high level of interest in working abroad was also noteworthy as this would have a considerable impact on workforce supply (Willis et al., 2009).

The present study results found that intention to quit the profession was not significantly related to sex. But a recent paper exploring intentions to leave among British pharmacists reported that male pharmacists were more likely than female pharmacists to intend to quit pharmacy (Seston et al., 2009). Hence, additional research is needed to investigate sex related intention of quitting within the pharmacy profession and address these inharmonious results.

It is also worrying that more than 1 in 10 pharmacists were highly likely to reduce their work hours. With supply of pharmacists already problematic, the effect of pharmacists reducing their work hours and leaving the profession could have a further dramatic affect on workforce supply. In a study done among British Pharmacists', intention to reduce work hours was found to be 1 in 5 pharmacists which was two times higher than Ethiopian Pharmacists (Hassel et al., 2006). The difference could be due to the fact that reducing work hours for pharmacists working in Ethiopia possibly will reduce their income and at times if they didn't comply with company's work hours, the owner would fire them. Consequently, the chance of getting alternative job and source of income is more challenging for pharmacists working in Ethiopia than in Britain. Thus, pharmacists working in Ethiopia might refrain from reducing their work hours unlike the British Pharmacists.

Significantly more community pharmacists' intended to reduce their hours of work relative to their other peer pharmacist. Similarly, intentions to reduce the work hours amongst British Pharmacists was reported to be more by community pharmacists than hospital pharmacists, a finding that may reflect a desire to avoid the long working hours in community pharmacy (Willis et al., 2009).

The present study documented that improving CPE opportunities as one of the main strategy to improve pharmacists' job satisfaction. Consistent to this finding, Murawski et al (2008) reported that CPE affects pharmacists' evaluation of the quality of their job and influence their job satisfaction because engaging in CPE allows pharmacists to learn and apply new skills that may lead to higher levels of perceived use of skills. CPE has an important role in helping pharmacists update their knowledge and ensure advancement of the pharmacy profession. The present study found that almost all (96.7%) of the pharmacists who took CE here highly appreciated the continuing education and thought it enhanced their knowledge and affected their practice

positively. And more than 90% of the pharmacists interviewed expressed their interest to join an accredited CPE program if launched by accredited institutions. In accord to this, a study done in United Arab Emirates indicates that 79% of the pharmacists thought that CE enhanced their knowledge and affected the way they practice (Hasan, 2009). Previous study on the assessment and impact of CE on pharmacists‘ knowledge or practice also recognized that there is a long-term gain in cognitive and psychomotor skills from interactive CE (Fjortoft and Schwartz, 2003; McConnell et al., 2009; Rouleau et al., 2007).

7. Conclusion and Recommendations

From this study it can be concluded that the pharmacist density in Ethiopia is by far lower than African countries average and that of WHO‘s recommendation. More over there is mal-distribution of the available workforce among regional states/city administrations where emerging regions do suffer severe shortages. The average annual loss rate of pharmacists in the country was also found to be 6.5%. With government plan to transfer the country to middle income economies within fifteen years, the country is required to produce from 28,278 to 30,003 pharmacists by 2024/25. Pharmacists‘ level of job satisfaction and plan to change work-life appeared to significantly vary with age, years of professional work experience, area and region of practice, and level of development of the practicing city/town. Pharmacists had lower extent of satisfaction scores and more than one in ten of the pharmacists have a plan to leave the profession.

Based on the findings the following recommendations can be made:

- Appropriate short and long term CPE should be organized for all professionals.
- Stakeholders; FMOH, academic institutions, professional association and others should work together to devise mechanisms for retention and expansion of the future workforce.
- The government should formulate different incentive mechanisms to alleviate the regional mal-distribution and improve job dissatisfaction of pharmacists.
- The FMOH should take the responsibility to prepare a clearly defined job description for pharmacists.
- Future research that aim at assessing all pharmacy workforce including pharmacists, druggists, pharmacy technicians and pharmacy aids should be done on regular intervals and plan should be done based on the results.

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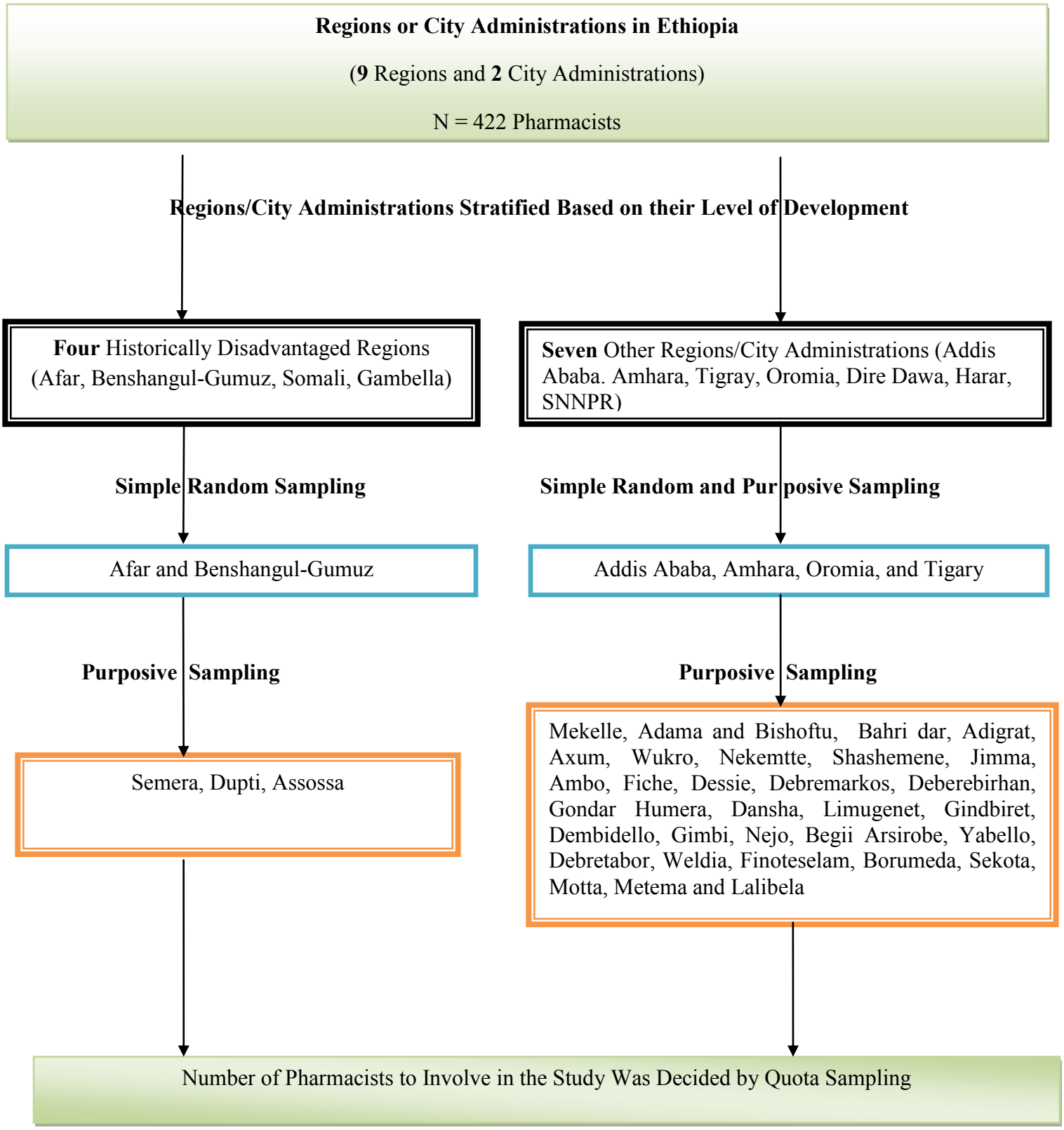
Annex –I: Sampling Frame for the Cross- sectional Study, Ethiopia, 2010.



Annex – II: Formats to be used for Census (Complete Enumeration) of Pharmacists in Ethiopia.

Addis Ababa University

School of pharmacy, Department of Pharmaceutics and Social Pharmacy, Pharmacoepidemiology and Social Pharmacy Stream

Assessment of Pharmacy Workforce in Ethiopia

Region:_____ Zone: _____ Date: _____

Area of practice		**No. of female pharmacist(s)**	**No. of male pharmacist(s)**	**Total No. of pharmacist(s)**	**Remark (if any)**
Hospitals	Government				
	Private				
	NGOs				
	others				
Health centers	Government				
	Private				
	NGOs				
	Others				
Community Pharmacy	Government				
	Private				
	NGOs				
	Others				
University and colleges	Government				
	Private				
Government Office (Regional, zone and weredas)					
Wholesale/Importer	Government				
	Private				
Regulatory Agency					
Other sectors, please specify:					

Annex-III: Self Administered Questionnaire for the Data Collection on Pharmacists' Level of Job Satisfaction and Work-life Change

Addis Ababa University

School of Pharmacy

Department of Pharmaceutics and Social Pharmacy

Pharmacy Workforce Survey Questionnaire

Purpose: The purpose of this study is to assess the pharmacy work force, job satisfaction and work-life change of pharmacists working in Ethiopia.

Your answers are very important and valuable to the successful completion of the study. Please be honest in filling this questionnaire, as it will be solely used for research purposes. The information you provide us will be confidential, anonymous, and data will be analyzed in aggregates.

If you have any questions or comment in the meantime, please feel free to contact the principal investigator, Gebremedhin B/mariam (Mobile: 0912-198210; e-mail: gebgeb95@gmail.com) or Asmamaw Sileshi fron the Ethiopian Pharmaceutical Association (Mobile: 0911449065).

Part I: Questions on Socio-demographic Characteristic of Respondents

1. Age in years: _____
2. Sex: ($_1$☐ Male $_2$☐ Female)
3. Marital status: ($_1$☐ Single $_2$☐ Married $_3$☐ Divorced $_4$☐ Widowed)
4. What is the highest education level you completed in pharmacy?

   $_1$☐ B.pharm $_2$☐ MSc in pharmacy $_3$☐ PhD in pharmacy

   $_4$☐ Others (Please Specify): _____
5. When did you get your first degree (B.Pharm)? You can answer in Ethiopian or Gregorian calendar. (_____E.C. or _____ G.C.)

6. How many year(s) of professional work experience do you have since you graduated B. Pharm? _____ years _____ months

7. Are you $_1$☐ an employer $_2$☐ an employee $_3$☐ Self employed ?

   If you are an employee please answer question **#8** and if you are not an employee please go to question **#9.**

8. Who is your employer?

   $_1$☐ Government employee $_2$☐ Non-governmental organizations (NGOs)

   $_3$☐ Private employee $_4$☐ Others, Please Specify: _____

9. Are you currently working as full-time or part-time? $_1$☐ Full time $_2$☐ Part time

10. What is your current job title? _____

Part II: Questions on Pharmacists Location of Practice and Area of Pharmacy Practice

11. **Region of Practice**: What is the region or city administration you are practicing now?

    $_1$☐ Addis Ababa $_2$☐ Diredawa $_3$☐ Amhara $_4$☐ Oromia

    $_5$☐ Tigray $_6$☐ Afar $_7$☐ Benshangul gumuz

12. The city/town you are currently working is _____

13. **Area of Pharmacy Practice:** Which of the following sectors of pharmacy do you work in? Please tick your main place of work. Please also write in the average number of hours per day and average number of days per week that you usually work.

Area of Pharmacy practice	Average number of hours worked per day	Average number of days worked per week
$_1$☐ Community Pharmacy		
$_2$☐ Hospital Pharmacy		
$_3$☐ Industrial Pharmacy		
$_4$☐ Academic and Research Institution		
$_5$☐ Sales and Marketing		
$_6$☐ Regulatory and Administrative Pharmacy in government		
$_7$☐Others (Please Specify)**:**_____		

14. How many year(s) of professional work experience do you have in your current area of practice? _____ years _____ months

Part III: Questions on Opportunities of the Professional in Getting Continuing Pharmacy Education (CPE)

15. Have you ever taken any continuing pharmacy education after you graduated B.Pharm?

    $_1$☐ Yes $_2$☐ No $_3$☐ Unsure

If your answer to question **#15** is **Yes** please answer question #16-17 and if your answer to question **#15** is **No**, please go to question **#18**.

16. When did you take the last continuing pharmacy education?

    $_1$☐ Less than 6 months ago $_2$☐ 6 months-1year ago $_3$☐More than 1year ago

17. Did the continuing education have a positive impact in your daily practice? ($_1$☐Yes, $_2$☐No)

18. If six months to one year duration of accredit certificate or diploma program is launched in all areas of pharmacy practice like in clinical pharmacy, are you interested to join in area of your choice? $_1$☐Yes, $_2$☐No

Part-IV: Questions on Pharmacists Level of Job Satisfaction and Work-life Change

19. **Job Satisfaction:** Please indicate how satisfied or dissatisfied you are with the various aspects of your job identified below;

Please circle one appropriate number for each item: 1= very dissatisfied(VD); 2= dissatisfied(D); 3=neutral (N); 4= satisfied(S); 5= very satisfied(VS)					
Item	**VD**	**D**	**N**	**S**	**VS**
The physical working conditions	1	2	3	4	5
Freedom to choose your own method of working	1	2	3	4	5
Your relation with colleague and fellow professionals	1	2	3	4	5
Recognition you get for good work	1	2	3	4	5
Amount of responsibility you are given	1	2	3	4	5
Your payment for your work (remuneration)	1	2	3	4	5

Please circle one appropriate number for each item: 1= very dissatisfied(VD); 2= dissatisfied(D); 3=neutral (N); 4= satisfied(S); 5= very satisfied(VS)					
Item	**VD**	**D**	**N**	**S**	**VS**
Opportunity to use your abilities	1	2	3	4	5
Your work load and staffing adequacy	1	2	3	4	5
Amount of variety in your job (scope of practice)	1	2	3	4	5
The way your boss handles his/her workers	1	2	3	4	5
The competence of your supervisor in making decisions	1	2	3	4	5
The chance to tell people what to do	1	2	3	4	5
Being able to do things that don‘t go against my conscience	1	2	3	4	5
The feeling of accomplishment I get from the job	1	2	3	4	5
The way institutional policies are put in to practice	1	2	3	4	5
The chances on advancement on this job	1	2	3	4	5
Taking everything in to consideration, how satisfied are you with your current main job?	1	2	3	4	5

20. Knowing what you know now, if you had to decide all over again, would you still choose to become a pharmacist? **Please circle one appropriate number.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

21. **About possible changes in your work-life:** over the next two years what is the likelihood that you will?

Please circle one appropriate number for each item: 1= Strongly Disagree**; 2** = Disagree**; 3**= Neutral**; 4**= Agree**; 5**= Strongly Agree					
Item	**Not Likely**	**Less likely**	**likely**	**More likely**	**Highly likely**
21a. Leave your current area of practice	1	2	3	4	5
21b. Reduce work hours	1	2	3	4	5
21c.Leave the profession altogether	1	2	3	4	5

If your answer to question **#21c** shows you have an intention to leave the profession altogether (change your work-life) please answer question **#22** and if your answer to question **#21c** shows you don‘t have an intention to change your work-life please go to question **#23.**

22. What is the main reason for your decision to change your work-life?

    1☐ Job dissatisfaction

    2☐ To retire

    3☐ Role ambiguity

    4☐ Others (Please Specify): _____

23. What recommendations do you forward to motivate pharmacists to remain in current area of practice? (More than one answers possible and if you have more answers please select the three most important).

    1☐ Increase in salary and benefits

    2☐ More variety in job (widening job scope)

    3☐ Better working conditions

    4☐ Better career development opportunities

    5☐ Recognition of achievements and contribution

    6☐ Improved continuing professional education opportunities

    7☐ Closer working relationships with other healthcare professionals

    8☐ Fair and equal treatment among professionals

    9☐ Others (Please Specify):_____

Thank you very much for your time and help!!!

Your cooperation is valued and greatly appreciated. If you would like further comment or share with us something please write in the blank space below.

_____

_____

Annex-IV: Guide for Key Informant Interview with Persons from Federal Ministry of Health

Assessment of Pharmacy Workforce in Ethiopia

Introduction: I want to thank you for your precious time that you allow me to talk with you. My name is Gebremedhin B/mariam and I am the principal investigator for the research entitled –Assessment of Pharmacy Workforce in Ethiopia."

Purpose of the Interview:

The need to have comprehensive document of human resource for health (HRH) is important for better management of the human resource and delivery of better healthcare services. However, Ethiopia is severely lagging in documentation of HRH. For the time being I am interested in pharmacy workforce and I would like to talk with you about your attitudes and feelings of pharmacy work force. The interview will take about 15 minutes. I will take notes of your comments but it might be difficult to capture all of your comments. Hence, in order not to miss any of your comments, I need your permission to use tape recorder. Your participation in the study is completely voluntary and you can refuse to answer any question at any time, for any reason, if you so decide. The information you provide me will be kept confidential where it will be shared to the research team only and we ensure you the information in the report doesn't identify you as the respondent.

Are you willing to participate in the interview?

☐ Yes ☐ No

If you say yes, the Interview begins

I. Background Information on Informant

Sex	
Age (in Years)	
Profession	
Role/position in the FMOH	
Work/Involved in the office/programme since	

II. Topics of Discussion

1. How do you assess the overall activity of pharmacists in the country as a member of the health care team?
2. How do you describe the importance of job description for health care professionals in the delivery of quality health services? Is there a written job description for all pharmacists practicing in different divisions within the ministry?
   2.1. If there is no job description, what is (are) the reason(s) and is there any future plan for preparation and implementation of it?
   2.2. If the job description is available, how do you assess its availability in all health institution where pharmacists are found? Is it easily accessible and known by all pharmacists? If not what are the reasons?

   Probe: If the job description is available, do you think pharmacists are now practicing in accordance to the job description and in line with the country‘s interest?
      a. If yes, to what extent?
      b. If no, what is (are) the reason (s)? Why your office in collaboration with the regions and health institutions enforce them to perform in accordance to the job description?
3. How do you see the differences in responsibilities of pharmacists and pharmacy technicians or druggists?
   3.1. In relation to their level of training
   3.2. In relation to the real practice in Ethiopia.

   If you think there is difference in level of training but no difference in practice, what do you think the reason is? And what should be done to maximize the benefit of patients from pharmacists?
4. How do you assess the level of distribution of pharmacists among regions?

   Probe: If you think there is unequal distribution what are the reasons and how is the ministry dealing with it?
5. Is there a deployment policy for health professionals?

   If yes how do you deploy pharmacists to the regions?

   Probe: how do you determine the required number of pharmacists to each region?

   If no, what is (are) the reason(s)? Is there a plan to prepare a deployment policy?

6. Were there times where the regions refused to employ pharmacists assigned by the FMOH? If yes, what was (were) the reason(s) and how you deal with it?

   Probe-I: If the reason is because they have enough number of pharmacists, what was their basis to reach in to this conclusion?

   Probe-II: If the reason is other than saturation (having enough number of pharmacists), is there any plan by your bureau to communicate with the regions and employ optimal number of pharmacists?

7. The role of pharmacist has been changed to more of patient-focus practice. In response to the public needs, the pharmacy curriculum is being reorganized from a focus on basic pharmaceutical sciences to more practical and clinical pharmacy education. How do you see the responsibility of the government in making the working environment conducive for clinical practice and working in collaboration with the stakeholders to maximize patient benefits?

8. I have finished my interview. Is there anything you would like to say?

Thank you very much for your time and cooperation!!!

Annex-V: Guide for key informant interview with Persons from Regional Health Bureaus

Assessment of Pharmacy Workforce in Ethiopia

Introduction: I want to thank you for your time that you allow me to talk with you. My name is Gebremedhin B/mariam and I am the principal investigator for the research entitled –Assessment of Pharmacy Workforce in Ethiopia."

Purpose of the Interview:

The need to have comprehensive document of human resource for health (HRH) is important for better management of the human resource and delivery of better healthcare services. However, Ethiopia is severely lagging in documentation of HRH. For the time being I am interested in pharmacy work force and I would like to talk with you about your attitudes and feelings of pharmacy work force. The interview will take about 20 minutes. I will take notes of your comments but it might be difficult to capture all of your comments. Hence, in order not to miss any of your comments, I need your permission to use tape recorder. Your participation in the study is completely voluntary and you can refuse to answer any question at any time, for any reason, if you so decide. The information you provide me will be kept confidential where it will be shared to the research team only and we ensure you the information in the report doesn't identify you as the respondent.

Are you willing to participate in the interview?

☐ Yes ☐ No

If you say yes, the Interview begins

I. Background Information on Informant

Sex	
Age (in Years)	
Profession	
Role/position in the regional health bureau	
Work/Involved in the office/programme since	

II. Topics of Discussion

9. How do you assess the overall activity/role of pharmacists in the region as a member of the health care team?
10. How do you describe the importance of job description for health workers in the delivery of quality health services? Is there a written job description for all pharmacists practicing in different divisions of the health sector within the region?

    2.1. If there is no job description, what is (are) the reason(s) and is there any future plan for preparation and implementation of it?

    2.2. If the job description is available, how do you assess its availability in all health institution where pharmacists are found? Is it easily accessible and known by all pharmacists? If not what are the reasons?

    Probe: If the job description is available, do you think pharmacists are now practicing in accordance to the job description within the region's interest?

    a. If yes, to what extent?

    b. If no, what is (are) the reason (s)? Why your region in collaboration with the health institutions enforce them to perform in accordance to the job description?
11. How do you see the differences in professional responsibilities of pharmacists and pharmacy technicians or druggists?

    3.1. In relation to their level of training

    3.2. In relation to the real practice in Ethiopia.

    If you think there is difference in level of training but no difference in practice, what do you think the reason is? And what should be done to maximize the benefit of patients from pharmacists?
12. Do all health institutions, which must have pharmacists on duty according to Federal Ministry of Health, in the region have pharmacists?

    4.1. If yes, do you think they are sufficient enough? If yes, what is your basis for decision?

    4.2. If no, what are the reasons and how does your office plan to solve the problem?
13. Were there times where your region returns pharmacists assigned by the FMOH?

    If yes, what was (were) the reason(s)?

Probe: If the reason is other than saturation (having enough number of pharmacists), is there any plan by your bureau to employ and maintain optimal number of pharmacists?

If yes, what are they and if no, why?

14. The role of pharmacist has been changed to more of patient-focus practice. In response to the public needs, the pharmacy curriculum is being reorganized from a focus on basic pharmaceutical sciences to more practical and clinical pharmacy. How do you see the responsibility of the government in making the working environment conducive for patient-oriented practice?
15. I have finished my interview. Is there anything you would like to say?

Thank you very much for your time and cooperation!!!

Annex–VI: List of Countries Density per 100,000 Population and GDP per Capita (USD) By World Bank Income Classification

Low-Income Countries

Country	GDP per capita [a]	Year	Density of pharmacists per 100,000 population [b]
Cameron	810	2004	5.80
Cote d'Ivoire	720	2004	4.51
Ghana	380	2004	7.38
Kenya	460	2004	3.9
Madagascar	300	2004	1.46

Middle-Income Countries

Country	GDP per capita [a]	Year	Density of pharmacists per 100,000 population [b]
Indonesia	1,120	2004	6.76
Thailand	2,360	2004	29.07
Czech Republic	7,730	2003	58.49
Hungary	8,600	2004	77.14
Turkey	3,620	2003	33.12
Uruguay	4,340	2004	32.17

Higher-Income Countries

Country	GDP per capita [a]	Year	Density of pharmacists per 100,000 population [b]
Canada	33,430	2005	88.56
Finland	33,760	2004	158.22
France	35,180	2005	116.08
Iceland	39,940	2004	125.42
Ireland	35,220	2004	85.04
Italy	26,630	2004	118.31
Japan	33,420	2003	179.87
United kingdom	34,650	2004	78.26
United states	41,440	2004	76.56

Data Sources:

[a] *Chan XH and Wuliji T (2006). Global Pharmacy Work force and Migration Report: A Call for Action. Available at:http://www.fip.org/files/fip/HR/FIP%20Global%20Pharmacy%20and%20Migration%20report%2007042006.PDF. (Accessed on November 30, 2009).*

[b] *World Bank Development Indicators: GNI per capita Atlas method (current US$). Available at: http://data.worldbank.org/indicator/NY.GNP.PCAP.CD. (Accessed on: August 20, 2010).*

Annex–VII: Amharic Version of Guide for Key Informant Interview with Persons from Federal Ministry of Health

አዲስ አበባ ዩኒቨርሲቲ

ፋርማሲ ት/ቤት

የፋርማሲ ሰው ኃይል ዳሰሳ በኢትዮጵያ

ለፌድራል ጤና ጥበቃ ሀላፊ/ባለሙያቃለ-መጠይቅ ማድረጊያ መመሪያ

መግቢያ፡ ስሜ ገብረመድህን በእደማሪያም እባላለሁ፡፡የዚህ ምርምር ማለትም " የፋርማሲ ሰው ሃይል ዳሰሳ በኢትዮጵያ " ዋነኛ ተመራማሪ ነኝ፡፡ ጊዜዎትን ሰጥተው ለዚህ ቃለ-መጠይቅ ስለተባበሩኝ አመሰግናለሁ፡፡

የቃለ-መጠይቁ አላማ፡-

በአንድ አገር ውስጥ የተሟላ የጤናው ዘርፍ የሰው ሀይል መረጃ መኖር ለአስተዳደራዊና በሀገሪቱ ውስጥ የተሻለ የጤና እንክብካቤ አገልግሎትን ለማዳረስ ጠቀሜታው ከፍ ያለ ነው፡፡ነገር ግን በዚሁ ረገድ በኢትዮጵያ እስካሁን ድረስ ወጥና በጥናት የተደገፈ መረጃ የለም፡፡ ለጊዜው ይህ ጥናት ትኩረት ያደረገው በፋርማሲ የሰው ሀይል በተለይም በፋርማሲስቶች ዙሪያ በመሆኑ በዚህ ሙያ ውስጥ ስላለው የሰው ሀይል በተመለከተ ባለዎት አስተያየት እንድንነጋገር እፈልጋለሁ። ቃለ መጠይቁ ከጊዜዎት 30 ደቂቃ አካባቢ የሚወስድ ሲሆን በፍጥነት የምንነጋገረውን ሁሉ በማስታወሻ መዝግቦ ለማስቀረት ስለሚያስቸግር ቴፕ ሪከርደር ለመጠቀም ቢፈቅዱልኝ? የርስዎ በጥናቱ ዉስጥ የመሳተፍ ሁኔታ ሙሉ በሙሉ በእርስዎ ፈቃደኝነት ላይ የተመሰረተ ሲሆን ማንኛዉንም ጥያቄ አለመመለስ ይችላሉ። አሁን የምንነጋገርባቸው ነጥቦች ሁሉ ሙሉ በሙሉ በምስጢር የሚጠበቁ ሲሆን ከምርምር ቡድኑ ውጭ ለማንም የማይገለጹ ይሆናሉ። ቃለመጠይቁን መሰረት በማድረግ የሚወጡ ሪፖርቶች/ዘገባዎችም የርስዎን ስም የማይጠቅሱ ይሆናሉ።

በዚህ ቃለመጠይቅ ለመሳተፍ ፈቃደኛ ነዎት?

□ አዎ □ አይደለሁም

ቃለመጠይቅ ሰጪው አዎ ካሉ ቃለመጠይቁ ይጀምራል።

I. ስለ ቃለመጠይቅ ሰጪው አጠቃላይ መረጃ፡-

እድሜ (በአመት)	
እድሜ (በአመት)	
ሙያ	
በክልሉ ጤና ቢሮ ውስጥ ያለዎት ሃላፊነት	
በዚህ ሃላፊነት ከመቸ ጀምሮ እየሰሩ ይገኛሉ?	

II. የመወያያ ርዕሶች፡

1. በኢትዮጵያ ውስጥ ያሉ ፋርማሲስቶች በጤና አገልግሎት ሰጭ ቡድን ውስጥ ያላቸውን አጠቃላይ ተሳትፎ እንዴት ያዩታል?
2. ጥራቱ የተጠበቀ የጤና አገልግሎት ከመስጠት አኳያ የጤና ባለሙያዎች የስራ ድርሻ ዝርዝር (job description) ጠቀሜታው እንዴት ያዩታል?

   በሚኒስቴር መ/ቤቱ ውስጥ በተለያየ የስራ ክፍል ውስጥ ለሚሰሩ ሁሉም ፋርማሲስቶች በፅሁፍ የተቀመጠ የስራ ድርሻ ዝርዝር አለ?

   2.1. የስራ ድርሻ ዝርዝሩ ከሌለ ምክንያቱ ምንድን ነው? ለወደፊትስ ይህን የስራ ድርሻ ዝርዝር ለማዘጋጀትና ተፈፃሚ ለማድረግ የተያዘ እቅድ አለ? ካለ ብያብራሩልን?

   2.2. የስራ ድርሻ ዝርዝሩ ካለ ፋርማሲስቶች በሚገኙበት ሁሉም የጤና ተቋማት ላይ መኖሩን እንዴት ያዩታል? በቀላሉ የሚገኝና ሁሉም ፋርማሲስቶች የሚያውቁት ነው? ይህ ካልሆነ ምክንያቱ ምንድን ነው?

   የስራ ድርሻ ዝርዝሩ አለ ከተባለ በአሁኑ ሰዓት ፋርማሲስቶች የስራ ድርሻ ዝርዝሩን ተከትለው አገሪቱ በምትፈልገው መልኩ እየሰሩ ነው ብለው ያምናሉ?

   ሀ. አዎ ካሉ በምን ያህል መጠን?

   ለ. አይደለም ካሉ ምክንያቱ ምንድን ነው? ሚኒስቴር መ/ቤቱ ከክልሎችና ከጤና ተቋማት ጋር በመተባበር ፋርማሲስቶች በስራ ድርሻ ዝርዝሩ መሰረት እንዲሰሩ ለምን ግፊት አያደርግም?

3. በፋርማሲስቶችና በፋርማሲ ቴክኒሻኖች ወይም በድራጊስቶች መካከል ያለውን ሙያዊ የስራ ልዩነት እንዴት ያዩታል? ማለትም፡-

   3.1. ካላቸው የትምህርት ደረጃ አንፃር

   3.2. በኢትዮጵያ ውስጥ ካለው ተጨባጭ የስራ ሁኔታ አንፃር

   ያላቸው የትምህርት ደረጃ የተለያየ ቢሆንም በስራው አለም ተመመሳሳይ ናቸው ብለው ካመኑ ምክንያቱ ምንድን ነው? ህሙማን ከፋርማሲስቶች የሚያገኙትን ጥቅም ለማሳደግ ምን መደረግ አለበት ብለው ያምናሉ?

4. በክልሎች መካከል ያለውን የፋርማሲስቶች ስርጭት እንዴት ይገመግሙታል?

   ስርጭቱ ተመጣጣኝ አይደለም ብለው ካመኑ ምክንያቱ ምንድነው? ይህን ችግር ለመፍታትስ ሚኒስቴር መ/ቤቱ ምን አይነት እርምጃ እየወሰደ ነው?

5. ለጤና ባለሙያዎች ምደባ የሚካሄድበት አሰራር (deployment policy) አለ?

   አለ ካሉ ፥ ፋርማሲስቶች የሚመደቡት እንዴት ነው?

   ለእያንዳንዱ ክልል የሚያስፈልገውን የፋርማሲስቶች ብዛት እንዴት ትወስናላችሁ/ታውቃላችሁ?

   የለም ካሉ ፥ ምክንያቱ ምንድነው? ለወደፊቱ የምደባ አሰራር ለማዘጋጀት የተያዘ እቅድ አለ? ካለ ብያብራሩልን።

6. በፌድራል ጤና ጥበቃ ሚኒስቴር የተመደቡ ፋርማሲስቶች ክልሎች የመለሱበት ጊዜ ነበር?

   አዎ ካሉ፥ ምክንያቱ(ቶቹ) ምን ነበር(ሩ)? ችግሩ ለመፍታትስ ምን አይነት እርምጃዎች ተወስደዋል?

   የመለሱበት ምክንያት በቂ የፋርማሲስት ቁጥር አለን የሚል ከሆነ፥ ለዚ ውሳኔ የደረሱት ከምን ተነስተው ነው?

ምክንያቱ በቂ የፋርማሲስት ቁጥር አለን የሚል ካልሆነ ለምሳሌ የበጀት ጉድለት ከሆነ፥ ሚኒስቴር መ/ቤቱ ከክልሎች ጋር በመነጋገር በቂ ፋርማሲስቶች ለመቅጠር የተያዘ እቅድ አለ? ካለ ብያብራሩልን።

7. በአሁኑ ሰአት የፋርማሲስቶች ሚና በብዛት ህመሙማንን ያማከለ እንዲሆን ለውጥ እየተካሄደ ነው።፡የህብረተሰቡን ፍላጎት መሰረት በማድረግ የፋርማሲ ትምህርት ካሪኩለም ከመሰረታዊ የፋርማሲዩቲካል ሳይንስ ወደ ተግባራዊና ክሊኒካል ፋርማሲ ተኮርነት እየተሸጋገረ ነው፡፡ በመሆኑም የስራ አካባቢውን ለክሊኒካል ፋርማሲ ተግባራዊነት ምቹ በማድረግ በኩል የመንግስትን ሀላፊነት እንዴት ያዩታል?
8. ቃለ-መጠይቄን ጨርሻለሁ፤መጨመር የሚፈልጉት ማናቸውም ነገር ካለ?

ጊዜዎትን ሰጥተው ይህን ቃለ-መጠይቅ እንዳደርግ ስለተባበሩኝ በጣም አመሰግናለሁ፡፡

Annex – VIII: Amharic Version of Guide for Key Informant Interview with Persons from Regional Health Bureaus

አዲስ አበባ ዩኒቨርሲቲ

ፋርማሲ ት/ቤት

የፋርማሲ ሰው ኃይል ዳሰሳ በኢትዮጵያ

ለክልል ጤና ቢሮ ሀላፊዎች/ባለሙያወች ቃለ-መጠይቅ ማድረጊያ መመሪያ

መግቢያ፡ ስሜ ጉበረመድህን በእደማሪያም እባላለሁ፡፡የዚህ ምርምር ማለትም " የፋርማሲ ሰው ሃይል ዳሰሳ በኢትዮጵያ " ዋነኛ ተመራማሪ ነኝ፡፡ ጊዜዎትን ሰጥተው ለዚህ ቃለ-መጠይቅ ስለተባበሩኝ አመሰግናለሁ፡፡

የቃለ-መጠይቁ አላማ፡

በአንድ አገር ውስጥ የተሟላ የጤናው ዘርፍ የሰው ሀይል መረጃ መኖር ለአስተዳደራዊና በሀገሪቱ ውስጥ የተሻለ የጤና እንክብካቤ አገልግሎትን ለማዳረስ ጠቀሜታው ከፍ ያለ ነው፡፡ነገር ግን በዚሁ ረገድ በኢትዮጵያ እስካሁን ድረስ ወጥና በጥናት የተደገፈ መረጃ የለም፡፡ ለጊዜው ይህ ጥናት ትኩረት ያደረገው በፋርማሲ የሰው ሀይል በተለይም በፋርማሲስቶች ዙሪያ በመሆኑ በዚህ ሙያ ውስጥ ስላለው የሰው ሀይል በተመለከተ ባለዎት አስተያየት እንድንነጋገር እፈልጋለሁ። ቃለ መጠይቁ ከጊዜዎት 30 ደቂቃ አካባቢ የሚወስድ ሲሆን በፍጥነት የምንነጋገረውን ሁሉ በማስታወሻ መዝግቦ ለማስቀረት ስለሚያስቸግር ቴፕ ሪከርደር ለመጠቀም ቢፈቅዱልኝ? የርስዎ በጥናቱ ዉስጥ የመሳተፍ ሁኔታ ሙሉ በሙሉ በእርስዎ ፈቃደኝነት ላይ የተመሰረተ ሲሆን ማንኛዉንም ጥያቄ አለመመለስ ይችላሉ። አሁን የምንነጋገርባቸው ነጥቦች ሁሉ ሙሉ በሙሉ በምስጢር የሚጠበቁ ሲሆን ከምርምር ቡድኑ ውጭ ለማንም የማይገለጹ ይሆናሉ። ቃለመጠይቁን መሰረት በማድረግ የሚወጡ ሪፖርቶች/ዘገባዎችም የርስዎን ስም የማይጠቅሱ ይሆናሉ።

በዚህ ቃለመጠይቅ ለመሳተፍ ፈቃደኛ ነዎት?

□ አዎ □ አይደለሁም

ቃለመጠይቅ ሰጪው አዎ ካሉ ቃለመጠይቁ ይጀምራል።

I. ስለ ቃለመጠይቅ ሰጪው አጠቃላይ መረጃ፡

ጾታ	
እድሜ (በአመት)	
ሙያ	
በክልሉ ጤና ቢሮ ውስጥ ያለዎት ሃላፊነት	
በዚህ ሃላፊነት ከመቸ ጀምሮ እየሰሩ ይገኛሉ?	

III. የመወያያ ርዕሶች፡

1. በክልሉ ውስጥ ያሉ ፋርማሲስቶች በጤና አገልግሎት ሰጭ ቡድን ውስጥ ያላቸውን አጠቃላይ ተሳትፎ እንዴት ያዩታል?
2. ጥራቱ የተጠበቀ የጤና አገልግሎት ከመስጠት አኳያ የጤና ባለሙያዎች የስራ ድርሻ ዝርዝር (job description) ጠቀሜታን እንዴት ያዩታል?

   በክልሉ ውስጥ በተለያየ የስራ ክፍል ውስጥ ለሚሰሩ ሁሉም ፋርማሲስቶች በፅሁፍ የተቀመጠ የስራ ድርሻ ዝርዝር አለ?

   2.1. የስራ ድርሻ ዝርዝሩ ከሌለ ምክንያቱ ምንድን ነው? ለወደፊትስ ይህን የስራ ድርሻ ዝርዝር ለማዘጋጀትና ተፈፃሚ ለማድረግ የተያዘ እቅድ አለ? ካለ ብያብራሩልን?

   2.2. የስራ ድርሻ ዝርዝሩ ካለ ፋርማሲስቶች በሚገኙበት ሁሉም የጤና ተቋማት ላይ መኖሩን እንዴት ያዩታል? በቀላሉ የሚገኝና ሁሉም ፋርማሲስቶች የሚያውቁት ነው? ይህ ካልሆነ ምክንያቱ ምንድን ነው?

   የስራ ድርሻ ዝርዝሩ አለ ከተባለ በአሁኑ ሰዓት ፋርማሲስቶች ክልሉ በሚፈልገው መልኩ የስራ ድርሻ ዝርዝሩን ተከትለው እየሰሩ ነው ብለው ያምናሉ?

   ሀ. አዎ ካሉ በምን ያህል መጠን?

   ለ. አይደለም ካሉ ምክንያቱ ምንድን ነው? ክልሉ ከጤና ተቋማቱ ጋር በመተባበር ፋርማሲስቶች በስራ ድርሻ ዝርዝሩ መሰረት እንዲሰሩ ለምን ግፊት አያደርግም?

3. በፋርማሲስቶችና በፋርማሲ ቴክኒሻኖች ወይም በድራጊስቶች መካከል ያለውን ሙያዊ የስራ ልዩነት እንዴት ያዩታል? ማለትም፡-

   3.1. ካላቸው የትምህርት ደረጃ አንፃር

   3.2. በኢትዮጵያ ውስጥ ካለው ተጨባጭ ሁኔታ አንፃር

   ያላቸው የትምህርት ደረጃ የተለያየ ቢሆንም በስራው አለም ተመመሳሳይ ናቸው ብለው ካመኑ ምክንያቱ ምንድን ነው? ህሙማን ከፋርማሲስቶች የሚያገኙትን ጥቅም ለማሳደግ ምን መደረግ አለበት ብለው ያምናሉ?

4. የፌዴራል የጤና ጥበቃ ሚኒስቴር ፋርማሲስቶች እንዲሰሩ በሚያዝባቸው ቦታወች ሁሉ በክልሉ ውስጥ የሚገኙ የጤና ተቋማት ፋርማሲስቶች አሏቸው?

   4.1. አዎ ካሉ በበቂ መጠን ይገኛሉ? ቁጥራቸው በቂ ነው ብለው ካሰቡ ይህን ያሉት በምን መስፈርት ነው?

   4.2. የለም ካሉ ያልሆነበት ምክንያት ምንድን ነው?ይህን ችግር ለመፍታትስ የእርስዎ ቢሮ ምን እቅድ ይዟል?

5. በፌዴራል የጤና ጥበቃ ሚኒስቴር የተመደቡላችሁን ፋርማሲስቶች የመለሳችሁበት ጊዜ ነበር?

   አዎ ካሉ ምክንያቱ ምን ነበር?

   ምክንያታችሁ በቂ የፋርማሲስት ቁጥር አለን የሚል ካልሆነ ተመጣጣኝ ብዛት ያለው ፋርማሲስቶችን ለመቅጠርና ለመያዝ እቅድ አለ? እቅድ ካለ ዘርዘር አድኢርገው ቢገልፁልን ፤ ከሌለ ደግሞ ምክንያቱ ምንድ ነው?

6. በአሁኑ ሰአት የፋርማሲስቶች ሚና በብዛት ህሙማንን ያማከለ እንዲሆን ለውጥ እየተካሄደ ነው፡፡የህብረተሰቡን ፍላጎት መሰረት በማድረግ የፋርማሲ ትምህርት ካሪኩለም ከመሰረታዊ የፋርማሲዩቲካል ሳይንስ ወደ ተግባራዊና ክሊኒካል ፋርማሲ ተኮርነት እየተሸጋገረ ነው፡፡ በመሆኑም የስራ አካባቢውን ለክሊኒካል ፋርማሲ ተግባራዊነት ምቹ በማድረግ በኩል የመንግስትን ሀላፊነት እንዴት ያዩታል?

7. ቃለ-መጠይቁን ጨርሻለሁ፤መጨመር የሚፈልጉት ማናቸውም ነገር ካለ?

   ጊዜዎትን ሰጥተው ይህን ቃለ-መጠይቅ እንዳደርግ ስለተባበሩኝ በጣም አመሰግናለሁ፡፡